Volume 5
Issue 9

RISC USER

August/September 1992
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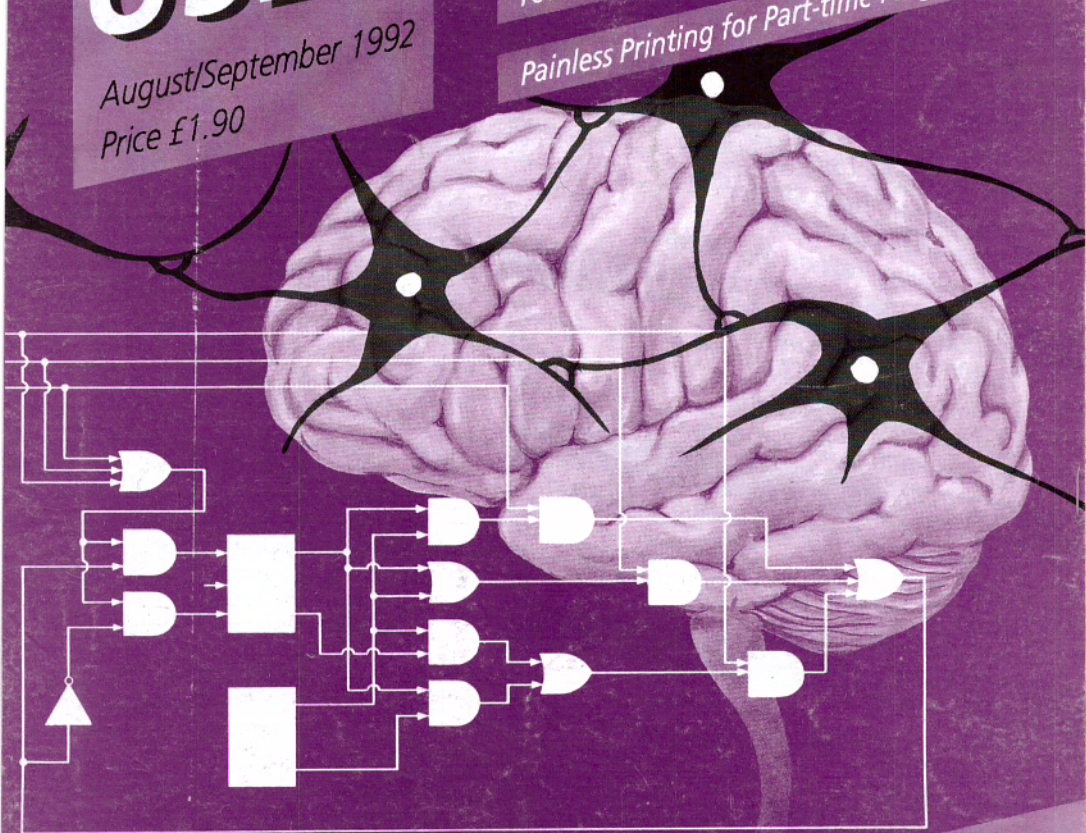
Vector: Object Oriented Drawing Application

Telephone Call Coster

TechWriter: Technical Wordprocessor

Painless Printing for Part-time Programmers



Neural Computing on the Arc

The magazine and support group exclusively for users of the Archimedes

ISSUE 9
VOLUME 5
AUGUST/SEPTEMBER 1992

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Co-Editors:
Dr Lee Calcraft, Mike Williams
Assistant Editor: Kristina Lucas
Technical Editor: Mark Moxon
Production Assistant: Sheila Stoneman
Advertising: Sarah Shrive
Subscriptions: Sue Baxter
Managing Editor: Sheridan Williams

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EDITORIAL

Acorn's A4 Notebook Computer

Last month we were able to distribute a comprehensive review of Acorn's long awaited laptop computer to coincide with the launch of this latest milestone in the history of the Archimedes. When you consider that you have all the power of an A5000 in a mere A4-sized case, then this is quite an achievement. This is a very professional system, and all Acorn fans will wish it well. We will be returning to take further looks at the new machine as production models become available.

Public Domain Software

The RISC User Public Domain Software Library has proved very popular since its inception last year, and the recent addition of five discs of quality software (as described in Simon Burrows' article on PD software in RISC User 5:5) has prompted heightened levels of interest. There is, however, one fundamental aspect of PD software which may not be apparent to everyone, and is thus worth repeating here.

As a distributor of PD software, we are only allowed by authors to make a reasonable charge (currently £1.60) to cover the cost to us of duplicating and mailing PD discs. Neither we (nor the author) is making a charge for the software, and we are only acting as a distribution agency.

We do make limited checks on all the software which we distribute in this way, but any problems which may arise from the use of PD software must be directed to the relevant author whose name and address will normally appear within the application directory as a text ReadMe or Help *file. Under the terms by which we provide this service we are unable to provide any technical backup or support. Of course, if you suspect that a PD disc which we have supplied is corrupt then we will gladly replace it if you return the original to us. Otherwise, please contact the author.*

ArcScan Indexes Updated and Reorganised

Readers who peruse our adverts will have seen that the indexe available with ArcScan have recently been extended. The inclusion of additional information has also required a reorganisation of the way in which the information is supplied.

The previous Library Disc becomes ***Library Disc 1*** *and now includes an index for* Archimedes World *along with those for* BBC Acorn User *and* Micro User.

The indexes for BEEBUG *and* RISC User *are now supplied separately as* ***Library Disc 2****. Both library discs will be updated monthly to keep them up to date with the latest issues, and the latest version can be purchased at any time (monthly indexes are also included on all RISC User magazine discs).*

RISC OS 3 users should note that we have now added indexes for the RISC OS 3 User Guide *and* Applications Guide *to the* ***ArcScan III*** *program disc, together with indexes for the* DDE (Desktop Development Environment)*. An index for the RISC OS 3 Programmer's Reference Manual will be added as soon as this is available from Acorn.*

Despite the changes, and the significant increase in the number and range of indexes now available, prices have been kept at existing levels (see details elsewhere in this issue). As a result ArcScan III now provides even better value than before.

In addition, this month's magazine disc contains an index to the RISC User Public Domain Library also in ArcScan format.

M.W.

• News • News • News • News

SHERSTON IN THE SKY WITH CRYSTALS

Sherston Software has released a new educational adventure game for the Archimedes range called *The Crystal Rain Forest*. The plot is startlingly close to home: the planet Oglo is having its last rain forest destroyed by the Cut and Run Saw Mill Gang, i.e. the baddies. The King of Oglo has banned all tree cutting, but the baddies have poisoned him and he lies dangerously ill in hospital. Only the children can save him, the forest and therefore the planet; all they have to do is find the magic crystals that can be found somewhere deep in the heart of the rain forest... if only it was that simple in real life!

Nearby, there are two broken rope bridges.

Go on

Another new product from Sherston is *Graph_IT*, a graph drawing package especially for schools. Graphs are produced simply by moving and clicking the mouse - for example, you can pull a bar chart to the correct height, or rotate a segment of a pie chart just by grabbing it. Numerical entry is also possible via the keyboard, and you can create bar charts, pie charts, line graphs and scatter graphs, in three dimensions where appropriate. Three outline fonts are provided with the package for adding labels, and graphs can be saved in Graph_IT format or as Draw files. Graph_IT costs £19.95 ex. VAT from Sherston Software, Swan Barton, Sherston, Malmesbury, Wiltshire SN16 0LH, tel. (0666) 840433, fax (0666) 840048.

BRAILLE CONVERSION

A new item of software has just been released which allows any ASCII file to be converted to a fully contracted Grade 2 Braille file, which can then be printed on a suitable Braille printer. The program costs £25 and is available from Dorton IT Support Centre, Royal London Society for the Blind, Dorton House, Seal, Sevenoaks, Kent TN15 0ED, tel. (0732) 63187.

COURSES AT BROAD OAK

Training courses for the Archimedes are now available from Broad Oak Computers at a special price of £50 ex. VAT per day. Courses are available for all levels, from beginners to advanced users, and they are run in the

GROOVY ARACHNIDS ON NEW OPTECH CD-ROMS

OpTech has announced details of more CD-ROMs for the Acorn Archimedes range (see the review of the *Dictionary of the Living World* CD-ROM elsewhere in this issue). For all the squeamish out there, *Creepy Crawlies* is a CD-ROM full of bugs, beetles and spiders. You can browse through a number of guided tours including the biology of pests, predators and life in the sea, and all the original picture and video material has been produced by Oxford Scientific Films, claimed to be the world's leading life science film makers. *Grooves* is a musical CD-ROM containing 100 clips of sound, most available in 8, 16 and 32 bar samples. All types of music are catered for, and OpTech says the clips are particularly well suited to business applications as many of the clips are geared towards a 'modern up-tempo style' - so no excuses for a lacklustre presentation. *Colour Image Library* is a vast selection of high quality images, ideal for use in desktop publishing. There are four main sections of pictures: Illustrations, Photos/Textures, Clip Art and Backgrounds.

Creepy Crawlies and Grooves each cost £99 ex. VAT, and Colour Image Library costs £59 ex. VAT; both should be available by the time you read this. Contact Optech at East Street, Farnham, Surrey GU9 7XX, tel. (0252) 714340, fax (0252) 711121.

CALLIGRAPH'S 1200dpi PRINTER

Calligraph, which has been involved in direct drive laser printers for some time with its ArcLaser product, has announced a true 600dpi direct drive laser printer for the Archimedes, the *Calligraph TQ-1200*. The printer has an engine capable of 600dpi, and the software allows print resolutions of 300dpi, 600dpi, 800dpi and pseudo-1200dpi to be achieved; the pseudo-1200dpi print is produced by changing the dot pitch to 1200dpi, though the dots remain at the same size as for 600dpi. The printer prints at 8 A4 pages per minute, and can handle paper sizes from A6 to A3, in a 250 sheet paper cassette. The printer can also print on materials such as envelopes, labels, polyester plates, as well as the new A3 Plazer plates which allow you to take the printer's output straight to a printing press, without the need for typesetting or photographic proofing.

The output from the printer is very crisp indeed, and Calligraph claims the cost of the printer is one third to a half of that of any other 600dpi A3 printer. Being a direct drive printer means it is much faster than normal laser printers (a 1200dpi A3 page typically takes only 45-50 seconds), though to use the full 1200dpi resolution will need 8Mb of memory in your computer, as a 1200dpi A3 page takes up 16Mb, which is then compressed to under 8Mb. The price for the printer, two paper trays, a manual paper stacker (all of which can take any paper size up to A3) is £5295 ex. VAT. For just the printer and a single paper tray the price is £4995 plus VAT. Educational discounts are also available. For details of the whole range of Calligraph printers (eight at the last count), contact Calligraph at 53 Panton Street, Cambridge, CB2 1HL, tel. (0223) 461143, fax (0223) 316144.

ACORN JOINS HUGH SYMONS IN QUEST

Hugh Symons Distribution, based in Poole, Dorset, has taken over the role of Acorn's distributor to the consumer market, serving around 300 independent retail dealers, replacing Bonsai Lightning and AB Eltec. Acorn itself will supply its products to its education dealers, High Street multiple retailers and to selected value-added resellers. Mike O'Riordan, Acorn's Marketing Manager, said Acorn is gearing up for an autumn attack on the High Street, and Hugh Symons will concentrate on promoting Acorn's

products within this sector to the independent retail dealer. The split with Bonsai was said to be perfectly agreeable, and was due to Bonsai's decision to change its marketing strategy, while AB Eltec will continue with Acorn as a dealer specialising in the education market.

The first collaboration between Hugh Symons and Acorn is the release of a new sports simulation game, *Quest for Gold*, programmed by Krisalis Software. This promotional effort is being supported by the former Olympic javelin thrower Fatima Whitbread and should prove topical with the Olympic Games underway.

The Hugh Symons Group has also been busy implementing its expansion plans by puchasing the Winchester based Concept Keyboard Company. The Concept Keyboard has been a very popular product in education, and this acquisition shows the close connections Hugh Symons has with education.

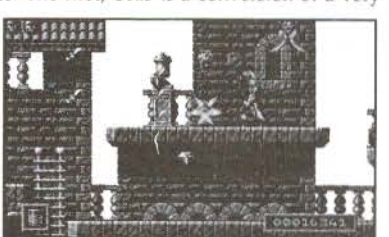
COLOUR WARS IN A BIT OF A STATE

State Machine is a new company which has tackled the thorny problem of enhancing the Archimedes' colour graphics capabilities. Its first card reduces the video circuit loading on the Archimedes' ARM processor, enabling much higher resolutions to be obtained on multisync and Super VGA monitors. For example, fully usable 256 colour 800 x 600 resolution or 16 colour 1024 x 768 is available on these monitors, and on selected high resolution monitors resolutions of up to 1152 x 852 (16 colour) or 1280 x 1024 (4 colour) would be possible. A special virtual window mode allows super large images to be panned and scrolled using an ordinary monitor. Standard screen modes which are normally quite sluggish will benefit from the card - for example, mode 21 will appear as speedy as using mode 20. In addition a 24-bit palette is provided to increase the number of normally available colours from just 4096 to 16.7 million hues. There are also plans to enable the PC Emulator to utilise accelerated screen modes. The card is scheduled for September and is expected to cost under £250.

A professional version of the card should also be ready for demonstration at the BBC Acorn User Show in October. This version will offer all the features of the cheaper card as well as true 24-bit gamma corrected colour graphics up to a resolution of 800 x 600 pixels, allowing the Archimedes to display photo-realistic quality images and retain Desktop compatibility for the first time. A tentative price for the professional card is under £750. For further details contact State Machine at Advanced House, Upper Wellington Street, Luton LU1 5AA, tel. (0582) 484266, fax (0582) 480833.

KRISALIS EX MACHINA

Krisalis, producers of some of the best games available for the Archimedes, has released two new games. The first, *Gods* is a conversion of a very popular Amiga game by the excellent Bitmap Brothers, which casts you as Hercules roaming through the depths of an ancient city in a search for the secret of immortality. With loads of intelligent (and hostile!) monsters to cope with, twenty different potions and power-ups and fifteen different weapon systems there is plenty to do, and the graphics and sound quality are excellent. The second



Gods

evenings and weekends as well as in the day, to make them more accessible. Student numbers are kept down to a maximum of 3 to ensure plenty of attention. Courses are avaiable on introductions to the A3000 and A5000, and many popular Archimedes products are covered. There is also a Basic V course and there will soon be C and Wimp programming courses. These courses complement Broad Oak's correspondence courses, which enable people to learn from home. For more information contact Broad Oak Computers at High Street, Hatfield Broad Oak, Bishops Stortford, Herts CM22 7HE, tel. (0279) 718767, fax (0279) 718596.

ACORN USER SHOW DATES

BBC Acorn User has announced the dates of its 1992 show, which will again be held at the Wembley Exhibition Centre. The show will be open to the public from 16th to 18th October 1992.

BIG BEN CHIMES AGAIN

The Dutch Acorn computer user society, the Big Ben Club, is having its annual open day on Saturday, 12th September at the 'Iripodia' community centre in Katwijk, Holland, some 20km north west of The Hague. The open day will be from 10am to 4.30pm, and entrance is free to members, and Hfl.5 to non-members. For more information, contact Big Ben Club, Public Relations, c/o Harry Linsen, Gommerskerspel 24, 2151 RA Nieuw-Vennep, Netherlands, tel. (+31) 2526 72385, fax (+31) 7034 38895 (note: telephone/fax numbers apply until August 15th only).

THE SILICON VISION SLOT

Yet more stirrings from Silicon Vision... a new driver has been produced for ARC-PCB which allows standard Excellon Drill files to be produced for use with automatic drilling machines. These files can be sent directly to PCB manufacturers to produce high quality PCB boards. There is also a driver for creating Gerber plot files which can be sent directly to photoplotter bureaux to produce the highest quality artwork. GerberPLOT costs £125 ex. VAT and ExcellonDRILL costs £75 ex. VAT from Silicon Vision, Signal House, Lyon Road, Harrow, Middlesex HA1 2AG, tel. 081-861 2173, fax 081-427 5169.

PLOTTER CZECHS OUT UK

Olga Brown, an art techer from Gloucester, has been using a Czechoslovakian plotter with an Archimedes, and is selling them for £295, about half the price of normal plotters in this country. The plotter, the ColorGraf 0516, is an 8 pen A3 HPGL compatible plotter, and Olga is selling screen dump software for £35. The results of the screendump sent to us are very interesting,

Hearsay II

The most advanced communications package for Archimedes systems.

Hearsay II is a multi-tasking and fully RISC OS compliant communications package designed for easy communications for the first-time user, but with a wide range of advanced features making it the professionals choice.

It is ideal for use with Prestel, Telecom Gold, Campus 2000 and Compuserve, and also provides very high quality VT320, VT102, VT52 and Tektronix 4105 Colour terminal emulations for direct connection to mini and mainframe hosts.

Members price £79.31

In addition it gives access to Minitel systems such as the Teletel service and provides Xmodem, Ymodem, Zmodem and Kermit file transfer, a comprehensive script language and an auto-dial number directory.

- Fully RISC OS compliant
- Multi-tasking and background transfers
- Scalable terminal windows
- Xmodem, Xmodem1K, Ymodem, Zmodem, Kermit, SEAlink, and ASCII file transfer
- Batch file transfer
- Script language based on a subset of C
- Macro processor and definable keyboard
- Support for RISC OS printer drivers
- Number directory with auto-logon and password protection
- MNP 2 and Vasscom error correction
- Supports most popular modems e.g. Hayes

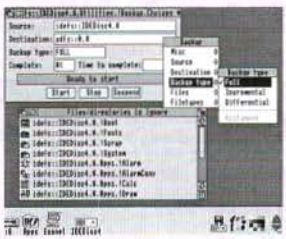
Upgrade to version II

Upgrade from Hearsay I for only £41.13 plus £3.10 carriage. Please return original disc to address below.

'It does everything we want, and is a pleasure to use.' *ARCHIVE Jan 92*
'Background data transfer, a well documented script language and high RISCOSity make this a powerful contender...' *ARCHIMEDES WORLD April 92*
'...the manual is an excellent example of thoroughness and clarity...Hearsay II is a very good communications package and is thoroughly recommended...' *ACORN USER May 92*

Hard Disc Companion II

Hard disc backup and retrieval



Version II of Hard Disc Companion offers superior performance and efficiency. It has been completely re-written and is now twice as fast and even easier to use.

It provides a structured approach to the backing up of hard drives, and the recovery of files in the event of disc failure or accidental file deletion. Both Full and Incremental backups are supported, and the files to be backed up or ignored may be specified using simple drag operations.

Members price £47.59

The entire backup specification may be saved in a script file for use at a later date. Hard Disc Companion II uses an efficient compression system to backup as much data as possible onto the floppies without increasing the backup time.

Separate applications are included to restore entire backups or just selected files.

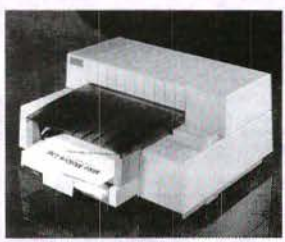
Upgrade to version II

Upgrade from Hard Disc Companion I for only £17.63 plus £2 carriage. Please return original disc to address below.

'Good value for money...A nearly foolproof interface...Hard Disc Companion keeps things simple and as fast as possible...' *MICRO USER May 92*
'...it is certainly the best hard disc backup utility that I have ever used.' *ARCHIVE Apr 92*

Colour Printer Drivers

For HP DeskJet 500C and Star colour printers



The **PrinterDJ** printer driver produces near laser quality output from the highly acclaimed Hewlett Packard DeskJet 500C colour printer.

Both release 2 and release 3 drivers are supplied, each supporting 75 x 75, 150 x 150 and 300 x 300 print resolutions in monochrome, grey scale and full colour modes.

Members price £15.86 each

PrinterLC is the approved printer driver for Star colour dot-matrix printers. It is suitable for both 9 and 24-pin printers including: LC24-200, LC-200, XB24-10 and LC-10. PrinterLC is a release 2 driver, supporting print resolutions from 60 x 72 dpi to 360 x 360 dpi depending on the printer model. Also suitable for many Epson and NEC colour printers.

RISC developments

RISC Developments Limited. 117 Hatfield Road, St. Albans, Herts. AL1 4JS. To order, or for more information, call (0727) 40303

All software is suitable for Archimedes, A5000 and A3000 systems with 1Mb RAM and RISC OS 2.00 or 3.00.
Prices include VAT but please add carriage of £3.10 for Hearsay II and £2 for other products.
All prices are for single users—site licence prices available on request.

game is *Nebulus*, which has a rather quirky storyline: someone has been building towers in the sea without planning permission, and you must knock them down by climbing to the top of each of them. The game has elements of both platform and arcade games, and has some fiendish puzzles to solve on the way. The price of each of these games is £25.99 inc. VAT, and they are both available from BEEBUG Retail or Krisalis Software, Teque House, Mason's Yard, Downs Row, Moorgate, Rotherham S60 2HD, tel. (0709) 372290.

COMPUTER CONCEPTS RELEASES NEW VERSION OF SCANLIGHT 256

Computer Concepts has improved its ScanLight 256 handheld 256 grey level scanner. The scanner now offers a maximum resolution of 400dpi with 256 true grey levels at a full width of 105mm. There is also support for monochrome, 16 grey level and 256 grey level scanning at 100, 200, 300 or 400dpi. New software features include on-screen dithering, flexible image enhancement controls, instant image rotation by any angle, a choice of sampling sizes and easy to use brightness and contrast controls. The new price is £199 ex. VAT for the scanner, interface board and software. Existing owners can upgrade their software for £10 ex. VAT. For more details contact Catharine Moir at Computer Concepts, Gaddesden Place, Hemel Hempstead, Herts HP2 6EX, tel. (0442) 63933, fax (0442) 231632.

RISC DEVELOPMENTS HAS A WAY WITH WORDS

RISC Developments (who publish this magazine) has announced new versions of its Ovation DTP package and its Desktop Thesaurus. Ovation version 1.3 now includes mail merge, pamphlet printing, rotated Draw files (and sprites in RISC OS 3), 1st Word Plus import, and a new Thesaurus hotlink to allow automatic transfer with Desktop Thesaurus. Draft printing has also been added, Draw file rendering has been speeded up, and the key short cuts have been improved. Ovation still costs £101.16 inc. VAT to members, £99 ex. VAT to non-members and £86.09 ex. VAT to education, with a 30 user site licence available for £475 ex. VAT. Upgrades are available for £5 ex. VAT plus £1 p&p (£6.88 inclusive) by sending your original program disc to RISC Developments. The site licence upgrade costs £15 ex. VAT.

Desktop Thesaurus version 1.10 now includes 13,750 keywords and 135,000 synonyms, and an improved compression system means the entire application now uses less than 450K of disc space. The hotlink with Ovation is also supported. Desktop Theasurus still costs only £20.09 inc. VAT to members, £19 ex. VAT to non-members, and an upgrade is available for £2 ex. VAT plus £1 p&p (£3.35 inclusive). RISC Developments is at 117 Hatfield Road, St Albans, Herts AL1 4JS, tel. (0727) 40303, fax (0727) 860263.

PORTABLE PC?

Further to last month's announcement of the A4 portable, Acorn are now bundling the PC Emulator (version 1.8) with every 4Mb RAM/60Mb hard disc A4 portable sold. The 2Mb RAM/floppy disc model does not include the PC Emulator, however.

SQUIRREL IMPROVEMENTS

Squirrel, the database from Digital Services, has been improved. The enhancements (42 in all, plus improvements in robustness) are too numerous to mention, and the upgrade will be mailed free of charge to existing Squirrel users. The price remains the same at £129 plus VAT (£516 ex. VAT for a site licence). Digital Services are on (0705) 210600/324934.

having an impressionistic feel to them - more details can be obtained from Olga Brown, 2 Westend Villas, Westend Parade, Gloucester GL1 2RY.

I HEARD IT THROUGH THE GRAPEVINE...

There have been various rumours bubbling through the pipeline that could cause quite a stir in the near future. The major (unconfirmed) story is that Acorn will be releasing two new machines for the BBC Acorn User Show in October (see dates below). The two machines, code-named Brisbane and Adelaide (the portable was code-named Perth), will each be A3000-styled with an ARM3 processor, RISC OS 3 and a high density drive. The difference between the two machines will be that one has a joystick port and the other has an Econet socket, but both will sell at a price in the budget end of the Archimedes range. Acorn were admitting nothing at the time of going to press, but we do know that A3000s purchased by education before the end of July will come with a free upgrade to RISC OS 3 (worth over £50), indicating Acorn's commitment to leave RISC OS 2 behind.

The RISC OS 3 operating system should also be available soon for existing machines, hopefully at a price of around £70 ex. VAT. It remains to be seen how RISC OS 3 will perform on ARM2 machines (as the new operating system has been designed for use on ARM3 machines), but ARM3 upgrade prices are still dropping. Another piece of Acorn gossip says that the RISC floating point chip is working and should be available for £60 to £70, also for October. This plugs straight into the socket in the A5000 and is a lot cheaper than the CISC version Acorn are supplying at the moment.

On the subject of the grapevine, ARM Ltd., who produce the ARM610 chip used in Apple's Newton personal organiser (see last month's news), is laying plans to produce an asynchronous version of the ARM chip. It is important to realise that this chip will not see the light of day for several years, as asynchronous chips are very much on the boundaries of current technology, but very phenomonal speeds could be possible (though it would be foolish to speculate just *how* phenomenal!). Asynchronous technology means that instructions do not have to take whole clock cycles to execute, so, for example, an instuction could take 0.14 clock cycles as opposed to 1 clock cycle. The computer's RAM would still have to be clocked, however, but the speed increase in processor throughput for non-RAM access instructions could be very impressive. ARM chips made up 4.6% of the world computer processor market last year, which is an extremely creditable figure for a single supplier, so it seems ARM Ltd. are going from strength to strength.

Neural Computing on the Arc

by Lee Calcraft

Neural computing is a relatively new field in which hardware or software is made to emulate the working processes of neurons in the cerebral cortex. The resultant 'engines' appear to have features not normally associated with traditional computers, such as pattern recognition, learning from mistakes and fault tolerance.

The purpose of this short article is to provide a brief introduction to the topic, and to give some hands-on experience by way of a short Basic program which implements an 8-neuron net.

BIOLOGICAL NEURONS

The human brain consists of some 10,000,000,000 neurons interconnected via 10,000,000,000,000 synapse junctions in a massively complex network (see figure 1).

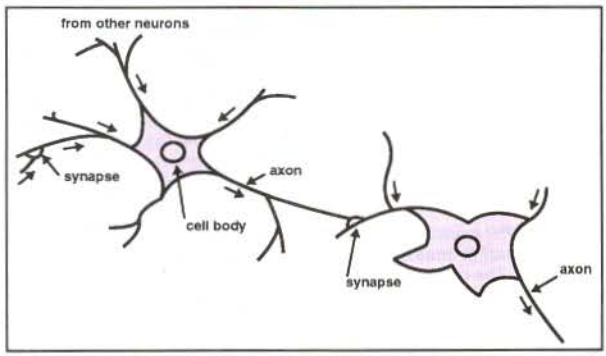


Figure 1. Each neuron may be connected, at synapse junctions, to 1000 or more inputs from other neurons and sensors. The neuron's output travels down the axon before dividing to supply input to other neurons.

This so-called *neural network* is the basis for all human perception, thought and memory. The one you use is busily at work right now identifying each word pattern on this page, and attempting to make sense of it in the light of a lifetime of learned experiences.

Although our understanding of how the brain functions is extremely limited indeed, it is possible to create a crude model of the operation of an archetypal neuron, and then to build simple working networks from this. This model assumes the neuron to be a single cell with multiple inputs, and a single output. This output can either be *on* or *off* (though real neurons output complex waveforms), and its state at any time depends on the sum of the excitations which it receives from its multiple inputs.

Each input passes through a multiplicative weighting mechanism (or synapse), and the neuron will 'fire' when the sum of its weighted inputs exceeds a certain threshold value - or in mathematical terms, when:

```
in1*w1 + in2*w2 + in3*w3 ... > T
```

where *in1* is the level at input one, and w1 the synaptic weight of this input, and where *T* is the neuron threshold (see figure 2).

Learning takes place through the adjustment of these weights. This can occur in a variety of ways. For example, feedback could be applied progressively to each of the weights in such a way as to adjust its value until the desired neural response is achieved. This provides a very simple illustration of the way in which a network can learn from experience, with the set of weights acting as a form of distributed memory, just as occurs in biological networks.

Like the many artificial neural networks used by experimenters and researchers, this one represents an extreme abstraction from reality. In practice there are many different kinds of neuron, and the way in which weights are varied during the learning process is not well understood. Nevertheless, artificial neural nets based on these very crude assumptions have already achieved some spectacular results.

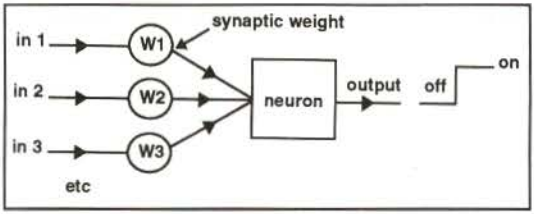


Figure 2. A neuron will fire when the weighted sum of its input signals exceeds the threshold.

Artificial neural nets containing of the order of 1000 neurons (equivalent to the brain power of an ant) have been taught to steer a car along a road, successfully distinguishing between real objects and shadows; to detect and respond to individual phonemes in human spech; and to 'learn' to generate recognisable speech.

Currently, artificial neural networks are implemented both as stand-alone electronic devices, and also as software implementations for digital computers. For the former, the state of the art is a single chip containing 600 neurons, while software implementations of 16,000 neurons will typically run at around 200,000 connections per second (on a 33MHz 386).

A PRACTICAL EXAMPLE

One thing which both neural networks and the human cortex are good at is pattern recognition. Whether this be audible or visual patterns, both biological and artificial nets are able to recognise patterns against backgrounds of high ambient noise (whether audible or visual), and to recognise patterns in cases where only a part is supplied.

We can illustrate this by simulating a simple auto-associative neural network using Basic on the Arc. Figure 3 gives a simplified schematic. The network has just one layer of 8 neurons, and the output of each is fed (via weighting synapses) into the input of all others - though for clarity only the outputs from one of the 8 neurons are depicted in figure 3. The learning rule used in this example is the so-called Hebbian rule. Here weights are given an initial value of zero, are adjusted in the upward direction only (i.e. no reductions in weighting occur, and no negative weights result), and only when the pre-synaptic and post-synaptic levels are both active. In other words: when the levels on either side of the weight are both high. There are many other learning rules - the most notable being the Hopfield and the Delta rules.

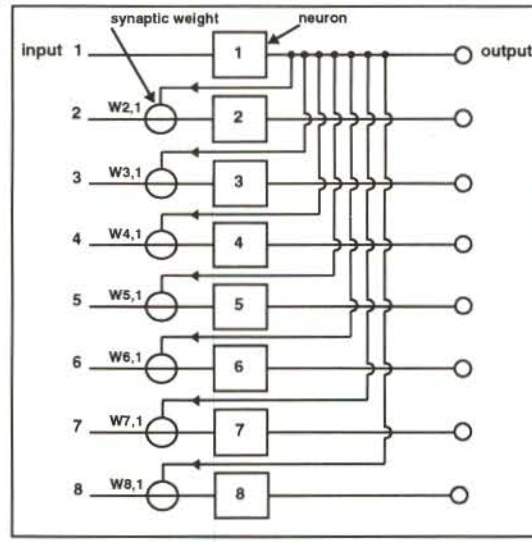


Figure 3. An 8-neuron single-layer auto-associative net. The output from each neuron is fed back via a weighted synapse junction to the input of each of the remainder (for clarity, only those from neuron 1 are shown here).

Our experimental network operates in two distinct phases: learning and recognition. During the learning phase, a particular pattern of inputs is presented (some inputs will be *on*, others will be *off*), and the synaptic weights are automatically adjusted according to the Hebbian rule. Another pattern may then be presented, and this will also be learned.

We can test the effectiveness of recall by entering the Test (or recognition) phase. Here we will find that this simple network will be able to reproduce at its output an exact replica of a learned pattern, even if only a part of such a pattern is presented at

the input. In other words this simple network exhibits associative memory - a property it shares with the human brain.

USING THE PROGRAM

The performance of this simple net is quite uncanny, and well worth experimenting with. Just type in the accompanying program, and run it either from Basic or by double-clicking on its icon from within the Desktop. A simple menu offers the following options:

Weight	Change weight factor
Learn	Learn a pattern
Test	Attempted recognition
Show Weights	Displays net weights
Clear Memory	Clear learned patterns
Quit	Exit

Begin by selecting "L" for *Learn*, and enter a string of up to eight ones and zeros. The 'ones' in this simulation are considered to form part of an image (say a pixel pattern) while the 'zeros' represent part of the background. Try for example entering:

```
11011
```

This is equivalent to entering 11011000, and will set the input to the first two neurons high, the next low, and the fourth and fifth high. The remainder (neurons 6-8) will be set to low.

Now select *Test*, and enter, say:

```
11
```

This enters a pattern of 11000000, and athough it contains only part of the learned pattern, you will see that the output is an exact replica of the complete learned pattern. In other words, the whole pattern has been recalled by association from only a fragment. The minimum size of the fragment from which a pattern can be recalled depends on the weighting factor used in the learning process, and its relationship to the neuron threshold. The default weight is 0.5, with a threshold of 1.0 (T in the program), and this gives a minimum fragment size of two input elements.

If you present the net with a pattern which does not contain a significant part of a learned pattern (e.g. 00001100 in the case above), it will simply reproduce it as it was entered. This is the same kind of processing which occurs at many different levels in the human brain, though we are rarely aware of it. As an example, if you hear the first two thirds of a familiar telephone number, you will be able to recall the whole number, but given only a small fragment of it, no recall will take place.

Our simple 8-neuron net can even cope simultaneously with a number of different patterns. To test this, without clearing the first pattern, teach it the following:

```
00001111
```

You will find that it still recalls the first pattern correctly when given a minimal clue (i.e. a fragment containing at least two elements), but now a clue to the second will recall the new pattern with the same veracity.

What is quite astounding is that the patterns are correctly recognised even if one of the two fragments presented for the test is a shared element of the two patterns (input 5 in our example). The exact number of elements shared between learned patterns that the net can tolerate depends (as does the size of the fragment required to trigger a particular recall) on the weighting factor (W) used during the learning phase, and this is well worth experimenting with. Try reducing it from 0.5 to 0.4.

I hope that these simple experiments illustrate something of the power of neural nets - and of course we are only scratching the surface here. Simple developments of the technique, such as including more than one processing layer (using so-called hidden layers), can result in much more sophisticated nets, including ones which will automatically learn from experience on a continuous basis, rather than employing two phases like our experimental auto-associative net.

Next month we will be reviewing a neural network tutorial package for the Arc, but in the mean time, if you would like further practical coverage of this topic in RISC User, please drop us a line.

```
   10 REM            >HebbNet
   20 REM Program    Neural Network
   30 REM Version    A 1.0
   40 REM Author     Lee Calcraft
   50 REM RISC User Aug/Sept 1992
   60 REM Copyright Lee Calcraft
   70 REM            Not Public Domain
   80 :
   90 MODE 12
  100 format=@%
  110 ON ERROR @%=format:REPORT:PRINT "
at line ";ERL:END
  120 PRINT "Neural Network Demonstratio
n"
  130 PRINT "Eight Neuron Auto-associati
ve Net"
  140 DIM in(10), out(10), wt(10,10)
  150 wt()=0
  160 quit=FALSE
  170 W=0.5:     REM default weight
  180 T=1.0:     REM neuron threshold
  190 N=8  :     REM no of neurons
  200 REPEAT
  210   PRINT '"Weight, Learn, Test, Sho
w Weights, Clear Memory or Quit"
  220   PRINT "W / L / T / S / C / Q ? "
;
  230   A=GET AND &DF
  240   PRINT'
  250   CASE A OF
  260     WHEN ASC("W")
  270       PRINT "Weighting factor (0-1
) (";W;") ";
  280       INPUT, W
  290     WHEN ASC("C")
  300       wt()=0
  310       PRINT "Memory Cleared"
  320     WHEN ASC("L"): PROClearn
  330     WHEN ASC("T"): PROCtest
  340     WHEN ASC("S"): PROCshow
  350     WHEN ASC("Q"): quit=TRUE
  360   ENDCASE
  370 UNTIL quit
  380 END
  390 :
  400 DEF PROClearn
  410 REM Learn new pattern
  420 INPUT "Pattern to learn: " A$
  430 in()=0
  440 FOR i=1 TO LEN(A$)
  450   in(i)=VAL(MID$(A$,i,1))
  460 NEXT
  470 FOR i=1 TO N
  480   FOR j=1 TO N
  490     IF in(i) AND in(j) AND i<>j TH
EN wt(i,j)+=W
  500   NEXT
  510 NEXT
  520 ENDPROC
  530 :
  540 DEF PROCtest
  550 REM Test pattern for a match
  560 INPUT "Pattern to test: " A$
  570 in()=0
  580 FOR i=1 TO LEN(A$)
  590   in(i)=VAL(MID$(A$,i,1))
  600 NEXT
  610 cycles=0
  620 REPEAT
  630   FOR i=1 TO N
  640     out(i)=in(i)
  650   NEXT
  660   no_change=FALSE
  670   FOR i=1 TO N
  680     old_val=out(i)
  690     FOR j=1 TO N
  700       IF i<>j THEN out(i)+=wt(i,j)
*out(j)
  710     NEXT
  720     IF out(i)>=T THEN out(i)=1 ELS
E out(i)=0
  730     IF old_val=out(i) THEN no_chan
ge=TRUE
  740   NEXT
  750 UNTIL no_change
  760 PRINT "Output:"SPC 10;
  770 FOR i=1 TO N
  780   PRINT ;out(i);" ";
  790 NEXT
  800 PRINT
  810 ENDPROC
  820 :
  830 DEF PROCshow
  840 REM Display array of weights
  850 PRINT SPC 13;
  860 FOR i=1 TO 8
  870   PRINT "   Wt";i;
  880 NEXT
  890 PRINT
  900 FOR i=1 TO N
  910   PRINT "Neuron ";i;SPC 5;
  920   @%=&020106
  930   FOR j=1 TO N
  940     IF wt(i,j)>0 THEN PRINT wt(i,j
); ELSE PRINT "    - ";
  950   NEXT
  960   PRINT:@%=format
  970 NEXT
  980 ENDPROC
```

RU

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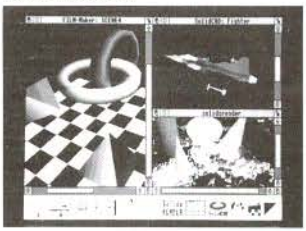
SolidTOOLS



The first fully integrated environment for 3D CAD, Photo-realistic rendering, Interactive animation, Texture mapping, Programmable animation and high resolution hardcopy to printers and plotters taking designers to new heights of design productivity and performance exceeding the capabilities of 'heavy-weight' packages on PC-compatibles and workstations which cost considerably more. The software provides 3D CAD facilities for Architectural, Engineering and Interior design offering a turnkey solution satisfying all your conceptual design and presentation requirements.

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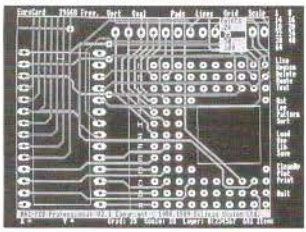
- A&B Computing November 1990.

ARC-PCB Schematics



The ultimate Electronic design package providing both circuit drawing and pcb layout in one design interface for a fully integrated system that surpasses all other PCB design systems in features & speed of operation for the fastest turnaround from concept to finished board design.
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The best BASIC V compiler money can buy. Features include an optimising compiler, relocatable modules with multiple star commands, Window-based or command line compilation environment, standalone code generation, in-line assembler with powerful floating point mnemonic extensions and a Desktop developers environment from a leading Software House renowned for technical excellence.

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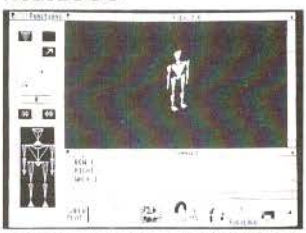
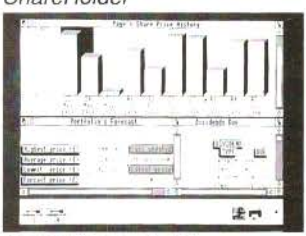
RoboLOGO



This new extension to traditional LOGO, provides three dimensional control of an articulated humanoid or animal figure based on the standard LOGO language. Natural commands such as 'Walking', 'Turning', 'Bowing', and 'Picking', etc are automatically represented graphically by natural movements of the 3D figure which is readily understood by students using LOGO as an introduction to computing. The traditional Turtlegraphics & 3D Glider features are also supported for students to further explore their school work.

"Takes turtlegraphics and LOGO programming into a new dimension. The things that the robot can do are only limited by imagination!" - Educational Computing April 1991

ShareHolder



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Vector

Reviewed by Richard Hallas

4Mation has released Vector, a new object-oriented drawing application. Programmed by the author of DrawPlus, Jonathan Marten, Vector is very much the successor to DrawPlus (itself an extension of Draw supplied with every Archimedes); it incorporates all the features of that program along with many more.

THE PACKAGE

Vector comes in 4Mation's usual glossy card wallet, which is attractive looking if a little flimsy. It is accompanied by two discs, a leaflet about copyright, a colour printout of some of the example files and a manual. The manual is absolutely superb, and is without doubt the best I have ever seen. It is a model of helpful clarity throughout, with lots of good examples and useful advice, and the presentation is nothing short of lavish: every page is in full colour, which really adds to the attraction and gets you excited about the product's capabilities.

The application disc contains Vector and a couple of font families, whilst the second contains a small number of high quality demonstration pictures and many examples and exercises to follow. The examples are well designed, and there is at least one exercise for each of Vector's special features.

IN USE

Most regular Archimedes users are sure to be familiar with DrawPlus (see article on PD software, *Select and Collect* by Simon Burrows in RISC User 5:7), and since Vector has all the special features contained in that program, there is little point in describing them in detail here. The Library function is almost identical, but now supports a compressed file format. Many useful libraries are supplied on the examples disc, including flowchart symbols and safety signs. The layers system is the same as before, although the obsolete background feature has now gone. In fact all of DrawPlus's features are available, but slightly streamlined where possible.

The most obvious initial difference comes when you open a new drawing window. Apart from the drawing section (which is initially rather small), there are three separate sections attached to the same window: a pair of rulers, a status line and a toolbox, and each can be turned on and off independently. Vector's toolbox is a great improvement: DrawPlus had a separate window for it, whilst Draw had a pane attached to the left of the window, which was a bit of a nuisance as it obscured part of the drawing when the window filled the screen. Vector's toolbox is also down the left, but is an integral part of the window, and so never overlaps the drawing.

Transforming text

The rulers are excellent, displaying needles which move with the pointer. There are four basic rulers available, and each can be set up in whatever way is required. Both the drawing and user units can be defined

separately, so it is easy, for example, to set up a scale of 4cm = 1km for mapping purposes. The grid can be either rectangular or isometric, and can either show points at every unit, or 'lines' which consist of points at all the subdivisions as well.

Creating enhanced colour range with dithering

There are two new drawing options: four-point curves and arcs. Four-point curves end up like Bezier curves except that you can specify two points on the way from start to finish, which makes curve-drawing a more accurate process. The arc feature is very welcome, as arcs were previously very difficult to achieve (but see *DrawTools*, RISC User 5:1). You simply specify a starting point, followed by the centre, then a second point on the circumference.

The remainder of the drawing facilities are the same as before, but with various editing enhancements. You can set whether a shape, dragged by its 'ears', will scale or rotate from its corner or its centre, and the rotation can also be set to occur around the rulers' origin, which can be displayed in the window and moved. The Edit menu remains the same, with the addition of a *Continue* option to add extra points to the end of a path. An extremely useful new option is available to merge several paths into a single one, and single paths can also be split into their component parts. As well as the usual *Front* and *Back* commands, objects can be sent to any position between the two extremes, and styles can be copied between objects.

Saving and zooming facilities have both been enhanced. The zoom now takes the form of a percentage up to 2000, and you can cycle through various zoom settings. There is also a useful option to scale the drawing to fit it in the window. As for saving, there is now an auto-save feature, and drawings can be saved in Vector, Poster or Draw format, along with a new compressed Draw file format.

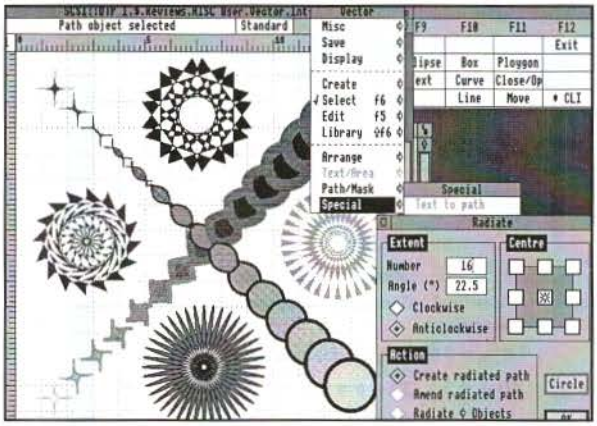
Comprehensive improvements have been made to the printing options. Drawings can be printed over several sheets, and the position and size of the drawing on the paper can be defined. It is also possible to specify the order of printing of pages, to minimise the amount of cutting required. The page boundaries can be displayed in the drawing window and, conversely, the area occupied by the drawing is displayed in the print setup box, along with all other relevant information about which pages are going to be printed, and in what order. These details can be altered very simply by clicking on the pages, providing a very flexible but easy to use system.

RISC OS 3 users can also rotate text, use kerning with fonts that support it, and convert text to path objects. The new operating system can also rotate sprites and use dithered colours to simulate more colours on screen. This works particularly well in 256 colour modes, and from a distance it appears as though full colour is really available. The Vector colour selector boxes are very flexible: as well as the normal Desktop colours and slider bars, you can select from a 256 colour palette, a 256 grey-scale palette or a colour cube. The 256 greys and colour cube options also use dithering when available, and work very effectively indeed.

MAJOR FEATURES

A look at the *Special* menu reveals five major new features, namely *Replicate*,

Radiate, *Skeleton*, *Mask* and *Interpolate*. *Replicate* lets you make copies of objects in a line or a matrix, which occupy only small amounts of extra memory. The function works in three ways: either as a 'dumb' copier, making identical copies of the original, or more usefully creating static or dynamic replicas. Static replicas can have operations applied to them as a set, but not individually. Dynamic replicas, which take a little more memory, can be scaled, moved and copied independently of the original, but not actually edited.

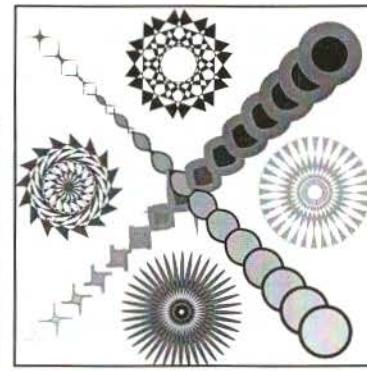


Replication and radiation in action

Skeletons are created from replicates, and are basically replicates with no objects in them. They can be individually scaled and positioned like replicates, and so by copying them, similar layouts with different objects can be achieved. In fact, a Library file with some predefined skeleton layouts is provided with the package.

Radiate lets you take a single path object (not a group) and make copies, rotated around a fixed point which can either be the path's centre or one of its sides or corners. The number of copies and angle between them can be specified, but a simple click on an icon makes them go into a circle. The resultant object can be converted into a single path object and filled with a colour, leading to some beautiful doily patterns.

The *Mask* option lets you use a path object as a window onto another object, the enclosed area of the path showing the masked object through it. Any shape of mask is possible, and you could even have text filled by a picture by first converting the text into path objects, then merging the paths and using the resultant path object as a mask.



Replication and radiation - the final result

The *Interpolate* feature takes two path objects with the same number of points, and works out the intermediate stages needed to turn one into the other (a process known as *inbetweening*). You specify the number of stages, and Vector creates a sequence of objects taking into account not only shape, but also colours and line thickness. Different effects can be achieved by reversing the path direction of one or both objects. One particularly clever exercise on disc interpolates between two apparently identical stick men with reversed paths, producing the frames of animation required for the man to walk from one position to the other.

With the exception of *Interpolate*, which just creates normal objects, all these features create objects which are unrecognised by normal Draw file rendering programs such as DTP packages. To get around this, all but the Mask objects can be turned into standard objects which occupy much more space, but can at least be used outside Vector. Mask objects are

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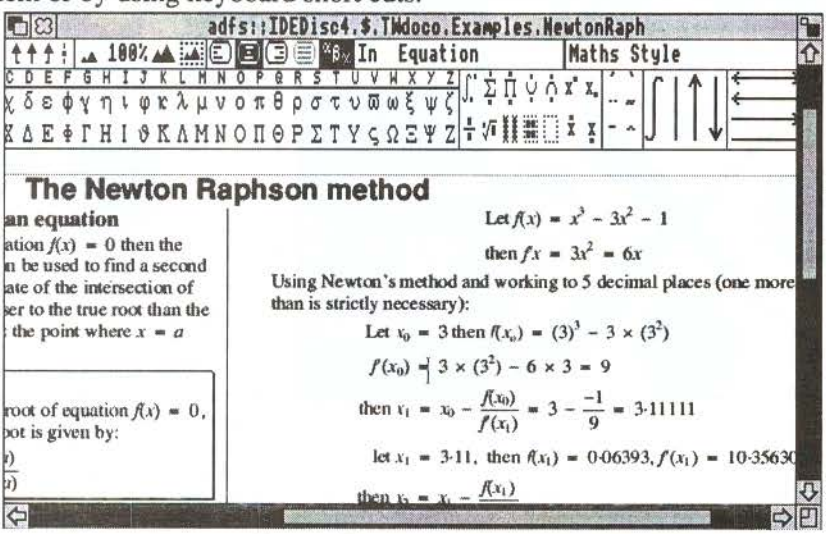
adfs::IDEDisc4.$.TWdoco.Examples.NewtonRaph
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In Equation
Maths Style
The Newton Raphson method
an equation
ation f(x) = 0 then the
n be used to find a second
ate of the intersection of
er to the true root than the
the point where x = a
root of equation f(x) = 0,
ot is given by:
Let f(x) = x³ − 3x² − 1
then fx = 3x² − 6x
Using Newton's method and working to 5 decimal places (one more than is strictly necessary):
Let x₀ = 3 then f(x₀) = (3)³ − 3 × (3²)
f(x₀) = 3 × (3²) − 6 × 3 = 9
then x₁ = x₀ − f(x₀)/f(x₁) = 3 − −1/9 = 3·11111
let x₁ = 3·11, then f(x₁) = 0·06393, f(x₁) = 10·3563
then x₂ = x₁ − f(x₁)

Incorporate equations into text

TechWriter's built-in equation editor lets you type equations directly into a line of text: $ax^2 + bx + c = 0$ or as displayed equations on a line by themselves:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad (2)$$

TechWriter knows the rules of mathematical typography and applies them automatically. It italicises variables, centres the contents of fractions, grows roots, fraction bars, overbars and delimiters as required and much more.

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too complicated to convert, although the same effect can be partially reproduced by a different approach. It is to be hoped that in future other applications will be updated to recognize the Vector file format. This is already under consideration for Ovation.

CRITICISMS

Throughout the review Vector performed almost faultlessly. I did find a couple of very minor bugs, but these are known about and being corrected. It is clear that a lot of thought and effort has gone into the program to get it to work well and look good, and it scores highly on all counts. It even supports interactive help. The only thing Draw can do that Vector can't is handle DXF files, although that is of minor importance.

The most frustrating problem I had was that a couple of my font names were too long to be handled by the program, and each time it was loaded it produced two error boxes to say that the fonts would be ignored. This obviously is inconvenient, but a fix is being considered. The important *Text* to *path* feature is currently only available to RISC OS 3, which is frustrating as it used to work in DrawPlus under RISC OS 2. However, the next version of Vector will support it for both versions of the operating system.

I can only really think of two things that are missing. One is a proper Undo function. The only guard against error is an Undelete option for mistakenly deleted objects, but if, for example, you accidentally give a group of multi-coloured objects the same colour, the only way out is to colour them individually all over again. It would be nice to see a proper undo, even if it only worked for the last operation.

I would also like to see some form of moulding feature in which an object or group could be moulded into a closed path object. Of course this can be done with Poster or TypeStudio, but it would be far more convenient to have the option built in to Vector. Such a feature could also be used to help create 3D projections.

CONCLUSION

Vector is an excellent package and a worthy successor to DrawPlus. The only fly in the ointment is that it does cost nigh on £100, whereas DrawPlus is virtually free. In a way DrawPlus was almost too good, because in all truth there isn't a great deal Vector can do that couldn't also be achieved a bit more laboriously with DrawPlus. There is no question that Vector is well worth the asking price: indeed, on a PC or Mac it would be amazing value. But PCs and Macs don't have Draw or DrawPlus, and given that these are both free, you don't get a huge amount more for what is quite an substantial outlay.

Masked text

However, I don't want to sound too negative. Vector will easily supplant any other packages of its kind to date, and for anyone who spends much time creating draw files, the extra editing facilities alone are certainly worth having. The printing options are very impressive indeed, and give another good reason for considering Vector. If other applications are updated to accept Vector's new file formats, investing in a copy will be even more worthwhile. Recommended.

Product	*Vector*
Supplier	*4Mation* *14 Castle Park Road,* *Barnstaple,* *Devon EX32 8PA.* *Tel. (0271) 25353* *Fax (0271) 22974*
Price	*£99.88 inc. VAT*

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Into the Arc

Creating ECF patterns in Paint

David Symes explains pattern generation in Paint using Extended Colour Fill (ECF).

Within the Paint application supplied with every Archimedes system there is a menu option which can be selected from the Paint submenu, *Select ECF*. The Risc OS User Guide has very little information about using ECF (Extended Colour Fill) and yet it is a very useful facility that can add a variety of textures to your work. In principle it allows part of a sprite to be used as a brush 'colour' or as a fill 'colour', and the facility is most useful for filling or painting in large areas with stippled or patterned effects. However, it's not a menu option that can be selected with abandon and requires some prior preparation. In this article I will describe how to create a repertoire of patterns for future use.

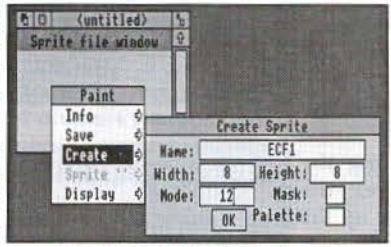

Fig.1 Creating the first ECF sprite

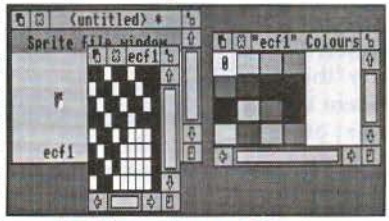

Fig.2 Generating an ECF pattern

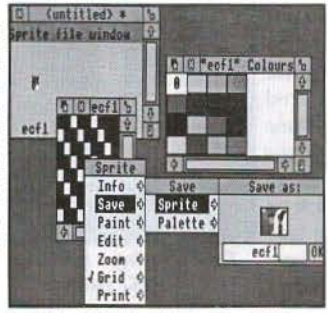

Fig.3 Saving the sprite ECF1

We will assume that Paint has already been loaded onto the icon bar. The first step is to create a sprite eight by eight pixels in size. Do this by clicking on Paint's icon bar icon with the Select button to display a *Sprite file window*, click the Menu button over this and select the *Create* option from the resulting menu (see fig.1). Name this sprite something like ECF1, set width and height to 8and click on 'OK'. The empty sprite ECF1 (or whatever) will now appear in the Sprite file window.

Double-click on this to obtain the sprite proper and then zoom it to 8 times normal size. With the grid on, fill individual pixels with black to make a pattern of your choice (a regular pattern is best - see fig.2). Remember though, in 16 colour modes the *select ECF* option will only utilise a pattern 8 pixels tall and 2 wide (User Guide page 133). Save the sprite, not the Sprite file window, to disc as ECF1 (fig.3).

Now rename the sprite as ECF2 and repeat the procedure to make a selection of sprites (named ECF1, ECF2, ECF3 and so on). When you have completed a selection of sprites, open the Paint application directory (hold down Shift and click twice with Select) and look for the *Sprites* file (not !Sprites). Open this and drop your ECF sprite collection into it (adding to the sprites already there - fig.4). Resave the *Sprites* file back into the Paint application (use the Save

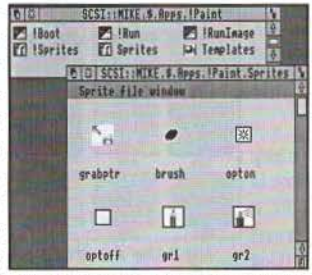

Fig.4 Opening the sprites file in Paint

option and click on 'OK'). Save any other Paint work you may have on the Desktop then quit Paint from the bar icon.

Now reload Paint from disc, and open a Sprite file window, and then the default size of sprite (call it *Patterns*) in the usual manner. Then using the Menu button over the sprite's area, bring up the Paint *colours* and *tools* windows. From the Paint menu choose *Select ECF* and move to the associated dialogue box. Enter the sprite name *ECF1*, Pattern 1, and click with Adjust on 'OK' (fig.5). Enter the next sprite name (ECF2), and Pattern 2, and click Adjust on 'OK' again. Continue up to Pattern 4. Four is the most allowed at any one time by the palette, though of course new sprites can be entered over the old ones at any time in the same way. Go to the top right of the palette Colours window and click on the window's *toggle size* icon in the top right-hand corner of the window; the window will then enlarge to show four new patterned icons at the bottom of the palette (fig.6). Any of these can be selected in the same way as the other colours.

To make it easy remembering which pattern is associated with which ECF number, use your current default size sprite called Patterns, and place on it as many rectangular outlines (use the *Rectangle outlines* tool) as you have ECF sprites. Use the *Replace colour* tool to flood fill each rectangle with a different ECF pattern (fig.7). Using the tools text option name each one, then print out to paper, and you have a permanent paper copy for easy reference (fig.8). The complete set of ECF patterns shown in the illustration is included on this month's magazine disc for you to incorporate into your copy of Paint as described above.

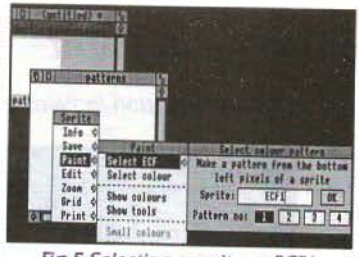

Fig.5 Selecting a sprite as ECF1

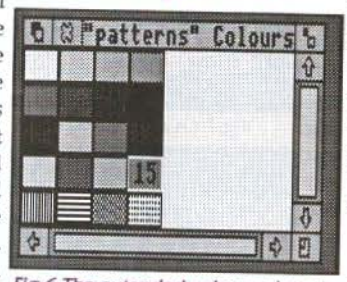

Fig.6 The extended colour palette in Paint showing four selected ECF patterns at foot

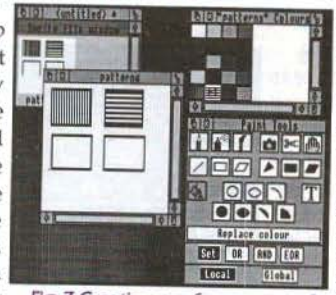

Fig.7 Creating a reference set of ECF patterns

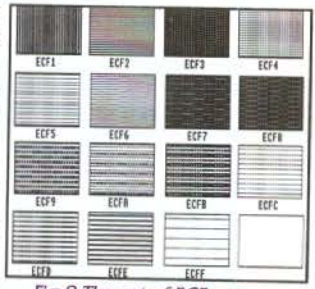

Fig.8 The set of ECF patterns supplied on this month's magazine disc

You don't need to confine yourself to black and white patterns only; exactly the same techniques can be used to build up a set of multi-coloured patterns for your every need. You can also use any ECF pattern with the Paint *brush* tool - just enter the name of the pattern sprite (ECF1 etc.) as before and click on 'OK' to confirm. Likewise with the brush tool you can select from 'OR', 'AND' and 'EOR' to provide further variations, all worth experimenting with. Now, each time you install Paint, all these ECF patterns will be immediately available.

NOTE: Make sure you keep a backup copy of the Paint application before you start editing the Sprites file within the application directory. If anything disasterous happens, make a new copy from your backup. RU

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The ArcScan III Library Disc has now been updated to include an index for all issues of Archimedes World (from January 1991) as well as indexes to Acorn User and Micro User:

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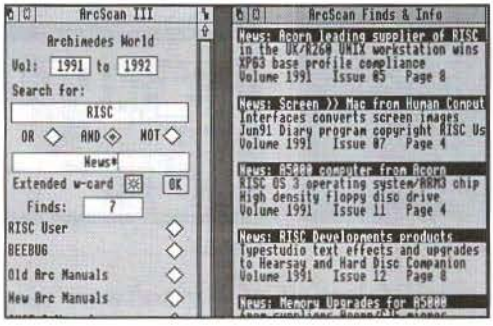
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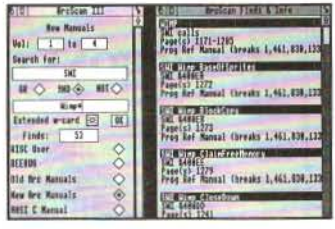

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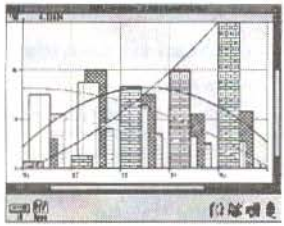

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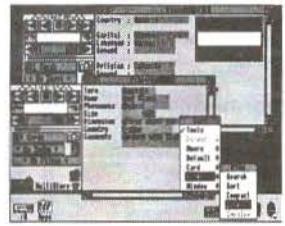

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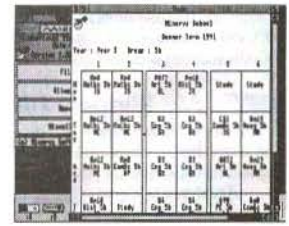

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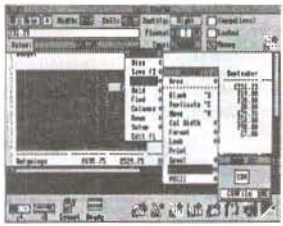

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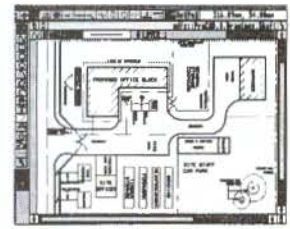

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TechWriter

Is it better than the rest?

Jim Lesurf assesses this technical word processor from Icon Technology.

Document processing systems like PipeDream4 and Ovation are flexible and fairly easy to use. But what if you often have to produce documents which include text, diagrams, and mathematical equations like:

$$C_{mn} = \{\varphi_m \mid \psi_n^*\}. \int_{-\beta}^{\eta} f'[x, t]\, dt \qquad \ldots(i)$$

or even monsters like: $\ldots(ii)$

$$\Omega' = \lim_{\zeta \to \tau} \sum_{j=2}^{\infty} \Gamma_j^{\chi} \int_{\zeta}^{\sqrt{\pi - 1}} \left\{ \frac{2\tau}{\omega\varpi} \right\}^{\varpi^4} (\lambda_j - \zeta)\, d\varpi$$

Attempting such efforts using 'normal' word processors can be a bit of a pain. Whilst acceptable results are possible, complicated equations can take a lot of time and effort to get right. *TechWriter*, from Icon Technology, is a newly released technical word processor which potentially offers the best of all worlds.

Up until now there have only really been three ways of combining text and equations. Perhaps the easiest was to use Computer Concept's Equasor (see review in RISC User 4:10) to create Draw files representing the equations, and then drag them into documents as if they were illustrations. The main problem with the Draw file technique is that it keeps shifting your attention away from the main text you're writing. Editing the equations in a document means moving back and forth between two applications. The extra Draw files can also take up an alarming amount of disc space if you use many equations in a document. An alternative technique was to find a suitable maths/Greek font and directly type in mathematical expressions. This works, but only for pretty basic equations.

The only other way has been to use TeX. Unfortunately, for anyone who is used to WYSIWYG, TeX is a nightmare! TeX is a professional typesetting system and can produce very impressive results. Many people swear by it. Alas, those of us who have been corrupted by the ease of DTP are more likely to swear at it! This is because it's a text compiler which takes plain ASCII files and uses command codes to generate the required output. As a result, only perfectionists use it if there are any alternatives which are easier.

ENTER TECHWRITER

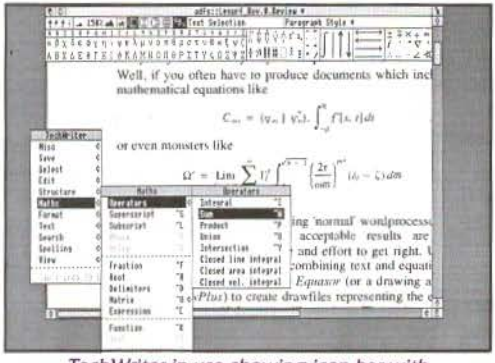
TechWriter is designed to solve these problems. It's a full-feature WYSIWYG word processor (based on EasiWriter - see review in RISC User 4:8) with extra features intended to make complex formulae as simple to type as text. Installing TechWriter is easy; just double-click on its icon and type your name into the icon slot that pops up. It can then be copied onto a hard disc.

Anyone familiar with EasiWriter (or MacAuthor and Formulator on the Apple Macintosh) should be able to use TechWriter almost immediately. Once started it works pretty much like most DTP or word processor applications. If you've used Impression or Ovation then learning to use TechWriter to write text shouldn't be even a minor problem. All the basic features work as you would expect. For example, you can mark blocks of text with the mouse, delete them with Ctrl-X, and paste them back with Ctrl-V. The window display can be resized or zoomed and the results are as WYSIWYG as the monitor permits.

So what about equations?

Under normal conditions, like everyone else, I only bother to read the instructions

when all else fails. However, the TechWriter manual starts with a set of useful tutorial examples designed to help you learn how to combine equations with text. I broke with tradition and worked my way through these. The results proved that it was quite easy to type equations into the document. For simple functions a set of fairly clear key-strokes (e.g. Ctrl-R for a 'root' sign) can be used. Mathematical symbols and Greek characters can be typed in from the keyboard or selected with the mouse from an icon bar at the top of the text window (this, and the text ruler, can be hidden when not needed).



TechWriter in use showing icon bar with mathematical symbols and Greek characters

Equations take two forms which are slightly different in appearance. 'In-Text' equations are started and finished with Ctrl-[and Ctrl-]. These are designed to look acceptable in lines of text - e.g. $\sqrt{a - \frac{5}{a}}$. Expressions (i) and (ii) above are examples of 'Display' equations. TechWriter makes a creditable attempt to lay out expressions in an attractive (and mathematically correct) way. If the results aren't quite what you'd like there's a set of kerning and realignment facilities to allow you to nudge them into the shape you want. The relative sizes of large 'operators' like integral signs and the position of their limiting values can be freely adjusted. The program can also produce a host of special effects including matrices, vector notations, even chemical formulae. In each it uses a set of inbuilt rules to achieve excellent results. One very strong plus point is that it's quite easy to edit expressions in a full WYSIWYG environment. Just position the cursor where you want it (even somewhere like a superscript of a superscript) and type in the changes.

After a day or so's practice I felt confident enough to start using TechWriter to write this review. That in itself can be taken as a sign that it is fairly easy to use. Although there isn't space to discuss them all here, TechWriter also has the sort of graphics features you'd expect. Draw and Paint files can be included in documents as illustrations which can be positioned, scaled, titled, etc. as required.

CONCLUSIONS

Overall, I have to say that TechWriter is excellent. I only have one reservation about it. The current file is kept 'open' and is updated as you work. The advantage of this is that the maximum document size is limited by the available disc space, not just the amount of memory you've bought. This is ideal for someone who wants to write a book, kept as a single file on a hard disc. Unfortunately, it can be a real pest when working with a smaller document held on a floppy. Scrolling up or down can involve noticeable delays while the program reads what it wants from the disc and saves any recent changes before they're dropped from memory.

Perhaps it's just a matter of taste, but I'm uncomfortable with this method of operation. I feel it's a bad habit to put a lot of work into a single file. The bigger a file is, the more work you lose as the result of a mistake! Since the file is open, some of the normal methods of making a backup copy whilst working are also difficult or impossible. Personally I'd much prefer this

to be a switchable option, or at least have the ability to set for myself a minimum file size below which it doesn't happen.

Since this bothered me I discussed it with Icon Technology. They told me, "Don't panic", updating is done in a way which should mean files won't become unreadable after a 'crash'. They also said that holding down Ctrl when loading a file tells the program to attempt to work 'in memory'. I checked this and can confirm that it does work. As a result, some time can be saved if you are writing short files held on floppies. Unfortunately, the suppression of unwanted disc operations seems to be cancelled as soon as you save a copy of the file.

Is TechWriter worth buying? If you don't want to produce equations the answer is probably no. The only price I've seen quoted is around £250, which makes it very expensive if you just want a good word processor or DTP system. However, for anyone who needs to produce documents which combine text, equations, tables, and illustrations, TechWriter is an excellent WYSIWYG way of getting impressive results. For scientists, engineers, and mathematicians it's worth very serious consideration. I'll certainly be using it for scientific documents in the future. It works, and it's a lot easier to use than TeX!

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RU

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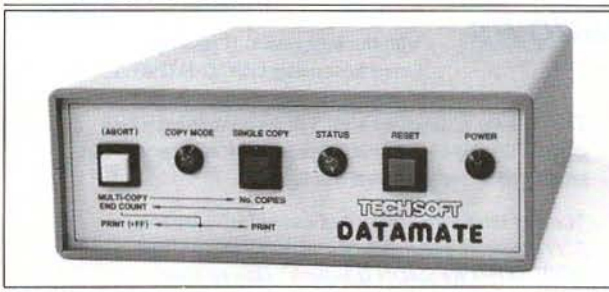

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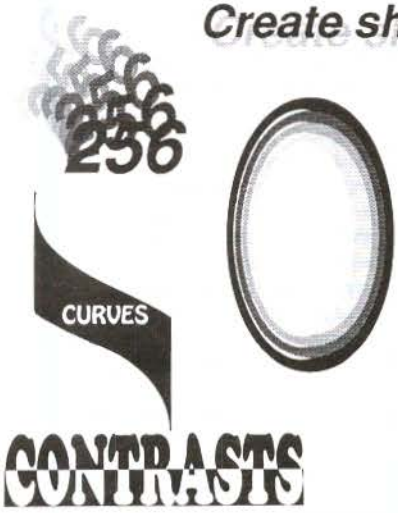

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WORD PROCESSING, 65, Milldale Crescent, Wolverhampton, West Midlands, WV10 6LR

Telephone Call Coster

Are your phone bills too high? Use this application by Alan Wrigley to see exactly where the money is going.

This multi-tasking application enables you to keep track of the cost of your telephone calls as you make them. Running the application displays the window shown in Figure 1. The call type (i.e. local, mobile or whatever) can be selected from the window, and once the timer is started it shows both the elapsed time and the current cost of the call, calculating the latter from the time of the call and a list of charges contained in a separate file.

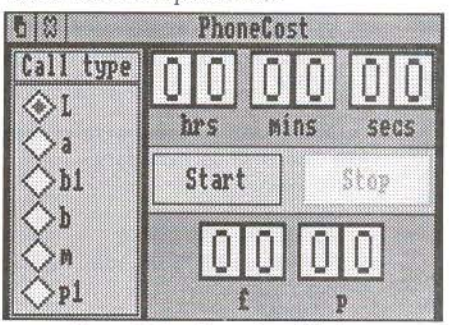

Figure 1. The PhoneCost Window

CREATING THE APPLICATION

First create an application directory called *!PhoneCost*, and place inside it the usual *!Run* and *!Sprites* files. *!Run* should be an Obey file containing the following lines:

```
Set PhoneCost$Dir <Obey$Dir>
WimpSlot -min 32K -max 32K
Run <Obey$Dir>.!RunImage
```

!Sprites should contain a 34x17 pixel mode 12 sprite called *!phonecost*, which will represent the application in the directory viewer and on the icon bar.

The application requires three further files. Firstly, there must be a sprite file called *Sprites* containing 10 sprites named *fig0*, *fig1* and so on up to *fig9*, representing the digits 0-9. These should be 24x16 pixels, again mode 12, and should look something like Figure 2. This is quite easy to do by using the text option in Paint with the x and y character sizes set to 16. The colours you choose are up to you, but blue on white would go well with the rest of the colour scheme.

Sprite "fig0". Similar sprites are required for the digits 1-9

Next type in Listing 1 and save it in the application directory as !RunImage. The listing requires a number of functions from the Wimp Library (RISC User 5:6 and 5:7), so you must have these functions available. Note; The changes to routine 5 in Wimp Lib must be typed in as described in this months Wimp Lib article. Line 80 of the program assumes that you have placed the WimpLib functions inside the *!PhoneCost* application directory; if not, you should alter that line so that it contains the correct pathname.

Finally, you need to create a text file called *Charges*, which will contain details of the current cost per unit, and the number of seconds per unit for each of the charge bands. This file must consist of 19 lines of text, each line containing one figure. The first line is the current cost per unit in hundredths of a penny, while the remaining lines represent the number of centiseconds allowed for each unit per charge band per time rate. In other words, the order should be L cheap, L standard, L peak, a cheap, a standard, a peak, b1 cheap, b1 standard, b1 peak, b cheap, b standard, b peak, m cheap, m standard, m peak, p1 cheap, p1 standard, p1 peak (where L, a, b1, b, m and p1 are the current BT inland charge bands). So the start of this file might look something like this:

```
420
22000
8000
5750
.....
```

Again, save this file inside the application directory.

USING THE APPLICATION

To use *PhoneCost*, double-click on its icon in a directory viewer to install the application on the icon bar. Clicking Select over the icon bar icon will open the window shown in Figure 1. The charge band can be selected from the icon group on the left. These are shown with the abbreviations used by British Telecom: *L* for local, *a*, *b1* and *b* for national, *m* for mobile and *p1* for Callstream (0898 numbers etc).

To start the timer, click on the *Start* icon. The upper digital display will now show the elapsed time, while the lower display will show the current cost. The cost is calculated from the data in the *Charges* file together with the time from the computer's real-time clock, so make sure your clock is correct! Clicking on the *Stop* icon will stop the timer, leaving the display showing the time and cost at that point.

Clicking Menu over the icon bar icon produces a menu with just one option: *Quit*. Clicking Menu over the window also displays a single-option menu, in this case *Reset*. Choosing this option resets all the figures in the window to zero.

PROGRAM TECHNIQUES

From a programmer's point of view, there are two interesting aspects to the program. Firstly, it provides a useful illustration of the technique of using sprite icons for simple animation in a window. By using indirected sprite icons in this way (created in lines 1820-1840 and 1890-1910), it is possible to alter the displayed sprite simply by changing the sprite name in the indirected buffer, and using *Wimp_SetIconState* to update the icon. This is a very effective method for simple applications, requiring no complicated window redraw routines, and is used here for updating the two digital displays.

Secondly, the program illustrates the use of the SWI *OS_ConvertDateAndTime* to convert a 5-byte real time value into a formatted string (line 320). This value could be obtained from the real-time clock using *OS_Word* 14, or as here, from the centisecond timer using *OS_ReadMonotonicTime*. For more information on these SWI calls, you are referred to the *Programmer's Reference Manual*.

The magazine disc contains an extended version of PhoneCost which also provides the facility to time international calls.

```
   10 REM             >!RunImage
   20 REM Program     Phone call coster
   30 REM Version     A1.00
   40 REM Author      Alan Wrigley
   50 REM RISC User Aug/Sept 1992
   60 REM Program     subject to copyright
   70 REM             Not public domain
   80 :
   90 LIBRARY "<PhoneCost$Dir>.WimpLib":
REM Customise if necessary
  100 PROCinit
  110 :
  120 REPEAT:CASE on% OF
  130 WHEN 0:SYS "Wimp_Poll",&1833,bk% T
O reason%
  140 WHEN 1:SYS "Wimp_PollIdle",&1832,b
k%,old% TO reason%
  150 ENDCASE
  160 CASE reason% OF
  170 WHEN 0
  180 SYS "OS_ReadMonotonicTime" TO new%
  190 old%=new%-1:PROCupdate
  200 WHEN 2:SYS "Wimp_OpenWindow",,bk%
  210 WHEN 3:SYS "Wimp_CloseWindow",,bk%
  220 WHEN 6:PROCbutton
  230 WHEN 8:PROCkeypress(bk%!24)
  240 WHEN 9:PROCmenuselect
  250 WHEN 17,18:IF bk%!16=0 quit%=TRUE
  260 ENDCASE
  270 UNTIL quit%
  280 SYS "Wimp_CloseDown"
  290 END
  300 :
  310 DEFPROCupdate
  320 gone%=new%-start%:!time%=gone%
  330 SYS "OS_ConvertDateAndTime",time%,
bk%+256,16,"%24%MI%SE"+CHR$0
  340 !bk%=main%:FOR i%=10 TO 15
  350 PROCset(i%,bk%?(i%+246)):NEXT
```

```
  360 ?realtime%=1
  370 SYS "OS_Word",14,realtime%
  380 hour%=FNtime(4):month%=FNtime(1)
  390 date%=FNtime(2)
  400 day%=realtime%?3:IF day%=1 OR day%
=7 OR month%=12 AND (date%=25 OR date%=2
6) OR month%=1 AND date%=1 THEN
  410 band%=0
  420 ELSE
  430 CASE TRUE OF
  440 WHEN hour%<8 OR hour%>17:band%=0
  450 WHEN hour%>8 AND hour%<13:band%=2
  460 OTHERWISE:band%=1
  470 ENDCASE
  480 ENDIF
  490 x%=unit%*(gone% DIV cost%(type%,ba
nd%)+1)
  500 y%=x% DIV 100-(x% MOD 100>0)
  510 !bk%=main%:FOR i%=0 TO 3
  520 z%=y% DIV 10^i%
  530 PROCset(23-i%,z% MOD 10+48):NEXT
  540 ENDPROC
  550 :
  560 DEFPROCset(ic%,new%)
  570 bk%!4=ic%
  580 SYS "Wimp_GetIconState",,bk%
  590 a%=bk%!28:IF a%?3<>new% THEN
  600 a%?3=new%:bk%!8=0:bk%!12=0
  610 SYS "Wimp_SetIconState",,bk%
  620 ENDIF
  630 ENDPROC
  640 :
  650 DEFFNtime(x%)
  660 =(realtime%?x% AND 15)+10*(realtim
e%?x% DIV 16)
  670 :
  680 DEFPROCbutton
  690 CASE bk%!8 OF
  700 WHEN 2:PROCmenu(-(bk%!12=main%))
  710 WHEN 1,4:CASE bk%!12 OF
  720 WHEN -2:!bk%=main%
  730 SYS "Wimp_GetWindowState",,bk%
  740 bk%!28=-1
  750 SYS "Wimp_OpenWindow",,bk%
  760 WHEN main%:PROCclick(bk%!16)
  770 ENDCASE
  780 ENDCASE
  790 ENDPROC
  800 :
  810 DEFPROCclick(ic%)
  820 CASE ic% OF
  830 WHEN 18:PROCstart
  840 WHEN 19:PROCstop
  850 WHEN 3,4,5,6,7,8:PROCbandchange
  860 ENDCASE
  870 ENDPROC
  880 :
  890 DEFPROCstart
  900 SYS "OS_ReadMonotonicTime" TO old%
  910 start%=old%:on%=1
  920 PROCfade(18,1):PROCfade(type%+3,0)
  930 ENDPROC
  940 :
  950 DEFPROCstop
  960 on%=0:PROCfade(19,1)
  970 PROCunfade
  980 ENDPROC
  990 :
 1000 DEFPROCfade(x%,y%)
 1010 !bk%=main%:IF y% THEN
 1020 bk%!4=x%:bk%!8=&400000
 1030 bk%!12=&400000
 1040 SYS "Wimp_SetIconState",,bk%
 1050 bk%!4=37-x%:bk%!8=0:bk%!12=&400000
 1060 SYS "Wimp_SetIconState",,bk%
 1070 ELSE
 1080 FOR i%=3 TO 8
 1090 bk%!4=i%:bk%!12=&400000
 1100 bk%!8=-&400000*(i%<>x%)
 1110 SYS "Wimp_SetIconState",,bk%
 1120 NEXT
 1130 ENDIF
 1140 ENDPROC
 1150 :
 1160 DEFPROCunfade
 1170 !bk%=main%:FOR i%=3 TO 8
 1180 bk%!4=i%:bk%!12=&400000:bk%!8=0
 1190 SYS "Wimp_SetIconState",,bk%
 1200 NEXT
 1210 ENDPROC
 1220 :
 1230 DEFPROCbandchange
 1240 IF type%=ic%-3 THEN
 1250 IF bk%!8=1 THEN
 1260 !bk%=main%:bk%!4=ic%
 1270 bk%!8=&200000:bk%!12=&200000
 1280 SYS "Wimp_SetIconState",,bk%
 1290 ENDIF
 1300 ELSE
 1310 type%=ic%-3
 1320 ENDIF
 1330 ENDPROC
```

Base 5 Base5 DBMS v2.00

Base5 DBMS is a suite of BASIC V functions and procedures designed to implement database programs. Now upgraded to v2.00, it remains fully compatible with RiscBASIC and ABC compilers.

- Fully compatible with RISC OS, with Wimp Interface support
- User configurable to optimise memory
- Extensive search features using a novel "data filtering" principle
- Multiple databases in use simultaneously with easy communication between them
- Rigorous in-built error checking and Command History
- Comprehensive documentation of tutorial material, language reference and file format
- Extensive import and export features
- A separate library of mathematical and calendar functions
- A fully multi-tasking database application !Base5 as a get-you-started entry point

AdMaths £25.00 Requires DBMS

A RISC OS application and three BASIC V libraries of advanced mathematical and statistical routines.

- Skewness, Pearsonian and Kurtosis indexes
- Median, Mode, Quartiles and Trimeans, Geometric, Harmonic and Quadratic means
- 3 non-linear Least Squares best fit plus Harmonic curve fit by Fourier analysis
- Fully programmable graphics routines for Pie, Bar, Line, Scatter, etc, diagrams
- Export of graphs as Sprites or Draw files for easy inclusion into DTP
- Separate library for any BASIC program to export graphically as Sprites or Draw files

PairData £22.50 Requires DBMS

A specialist multi-tasking application and BASIC V library for the creation and processing of two dimensional coordinate pair data.

- !MouseIn, a fully multi-tasking utility to write pointer coordinates directly into databases
- Centre of Gravity, mean distances, nearest and furthest point calculations etc.

MailMerge £10.00 ***NEW*** Requires DBMS

A RISC OS compliant application and BASIC V library to merge text with databases to produce mail.

- Output options to ease interface with word processors, printers and DTPs
- Merges data from multiple databases
- Programmable delimiter characters
- Special date, time, serial number and file name merging facilities
- Direct insertion of control sequences into !Edit windows

WordStock £25.00 ***NEW***

This fully multi-tasking stand-alone application uses database technology to directly insert often used words, phrases and specialist text into !Edit or DTP windows from single key presses. You can define up to 77 personal lexicons, each containing over 300 entries.

Base5
P.O. Box 378
WOKING
Surrey GU21 4DF
Great Britain

Base5 DBMS	**£69.00**
Demo Disc	**£5.00**
	refundable on purchase of DBMS
	No V.A.T.

```
 1340 :
 1350 DEFPROCmenu(m%)
 1360 menuopen%=m%:CASE m% OF
 1370 WHEN 0:x%=!bk%-64:y%=140
 1380 $(menu%+40)="Quit"
 1390 WHEN 1:x%=!bk%-64:y%=bk%!4
 1400 menu%!36=&7000021+&400000*on%
 1410 $(menu%+40)="Reset"
 1420 ENDCASE
 1430 SYS "Wimp_CreateMenu",,menu%,x%,y%
 1440 ENDPROC
 1450 :
 1460 DEFPROCmenuselect
 1470 SYS "Wimp_GetPointerInfo",,bk%+256
 1480 button%=bk%!264
 1490 CASE menuopen% OF
 1500 WHEN 0:quit%=TRUE
 1510 WHEN 1:!bk%=main%:FOR i%=10 TO 23
 1520 IF i%<16 OR i%>19 PROCchange_icon(
bk%,main%,i%,"fig0")
 1530 NEXT
 1540 ENDCASE
 1550 IF button%=1 PROCmenu(menuopen%)
 1560 ENDPROC
 1570 :
 1580 DEFPROCinit
 1590 DIM bk% 1500,menu% 51,valid% 17
 1600 DIM ind% 512,time% 7,realtime% 7,c
ost%(5,2)
 1610 quit%=0:on%=0:type%=0
 1620 $valid%="Sradiooff,radioon"
 1630 name$="PhoneCost":time%!4=0
 1640 SYS "Wimp_Initialise",200,&4B53415
4,name$
 1650 ON ERROR PROCerror:END
 1660 :
 1670 spr%=FNload_sprites("<PhoneCost$Di
r>.Sprites")
 1680 main%=FNcreate_window(bk%,314,630,
564,362,564,362,0,0,"PhoneCost",12,&8700
0012,0,1,-1,&19,7,2,7,11,3,2,3,0,0,0,1)
 1690 i%=ind%
 1700 a%=FNcreate_icon(bk%,main%,4,4,176
,354,&2800003D,"",0,0,0)
 1710 a%=FNcreate_icon(bk%,main%,10,10,1
64,40,&1700003D,"Band",0,0,0)
 1720 a%=FNcreate_icon(bk%,main%,10,52,1
64,300,&1700003D,"",0,0,0)
 1730 FOR j%=0 TO 5:READ a$
 1740 a%=FNcreate_icon(bk%,main%,22,58+j
%*48,110,48,&1702B133-&200000*(j%=0),a$,
i%,valid%,3)
 1750 i%+=LENa$+1:NEXT
 1760 a%=FNcreate_icon(bk%,main%,184,4,3
76,354,&2800003D,"",0,0,0)
 1770 FOR j%=0 TO 5
 1780 a%=FNcreate_icon(bk%,main%,188+56*
j%-16*(j%>1)-16*(j%>3),8,56,76,&8800013E
,"fig0",i%,spr%,5)
 1790 i%+=5:NEXT
 1800 a%=FNcreate_icon(bk%,main%,188,86,
368,40,&27000139," hrs    mins    secs",
i%,-1,21)
 1810 a%=FNcreate_icon(bk%,main%,184,132
,376,88,&1800003D,"",0,0,0)
 1820 a%=FNcreate_icon(bk%,main%,192,142
,166,66,&C701903D,"Start",0,0,0)
 1830 a%=FNcreate_icon(bk%,main%,386,142
,166,66,&C741903D,"Stop",0,0,0)
 1840 i%+=21:FOR j%=0 TO 3
 1850 a%=FNcreate_icon(bk%,main%,252+56*
j%-16*(j%>1),230,56,76,&8800013E,"fig0",
i%,spr%,5)
 1860 i%+=5:NEXT
 1870 a%=FNcreate_icon(bk%,main%,270,310
,208,44,&27000039,"FALSE       p",0,0,0)
 1880 a%=FNicon_bar_icon(bk%,"!phonecost
",-1)
 1890 :
 1900 file%=OPENUP("<PhoneCost$Dir>.Char
ges")
 1910 unit%=VAL(GET$#file%)
 1920 FOR i%=0 TO 5:FOR j%=0 TO 2
 1930 cost%(i%,j%)=VAL(GET$#file%)
 1940 NEXT:NEXT:CLOSE#file%:file%=0
 1950 :
 1960 $menu%="PhoneCost":menu%!12=&70207
 1970 menu%!16=112:menu%!20=44
 1980 menu%!24=0:menu%!28=&80
 1990 menu%!32=-1:menu%!36=&7000021
 2000 ENDPROC
 2010 :
 2020 DEFPROCerror
 2030 a%=FNwimperror(bk%,255,REPORT$+" -
 internal error code "+STR$ERL,name$,1,0
)
 2040 IF file% CLOSE#file%
 2050 SYS "Wimp_CloseDown"
 2060 ENDPROC
 2070 :
 2080 DATA L,a,b1,b,m,p1
```

RU

DeskEdit

(Version 1.20)

A powerful upgrade of this popular all-purpose text editor for the Archimedes

...a wonderful piece of software... deserves to be on everyone's icon bar... Archive

A new ***single key save-and-run feature in Basic mode***, permits virtually instantaneous testing of programs and applications as you edit them. To make Basic editing even easier, an automatic LISTO 1 is applied when numbered programs are loaded (and the spaces are automatically removed on saving).

The ***improved procedure and function browser*** now lets you browse procedure and function definitions in both directions (Ctrl-D takes you to the next definition, while Ctrl-Sh-D takes you to the one above etc).

In text mode, ***wordwrap control*** has been improved, while in *C mode syntax checking* has been extended, and a special Search option lets you search for function definitions.

Other ***new features*** are: • dynamic date insertion, • Left and Right Justify, • bracket matching, • Align Columns and the Char Info option (Ctrl-? puts up a box giving the ASCII code of the character at the caret in hex and decimal, and any special function it may have - e.g. Bold On etc.).

...offers much to the user... a good deal of thought has gone into its development... Acorn User

... very attractive ..... remarkably inexpensive for what it offers.... should prove very popular... Archimedes World

DeskEdit

is the ultimate all-purpose editor for the Archimedes, with special features for use with plain text, Basic and C source.

Edit your Basic programs on the desktop and test them interactively with a single key press.

DeskEdit features

- Three special Find and Replace modes - from Simple to Power Search
- Additional Quick-Search mode for rapid retrieval
- Text macros to insert user strings in both text and source code
- Special Undelete buffer for moving text around, in addition to Edit-style Undo/Redo
- Dedicated markers and position finders for finding your way around large files
- Clipboard, providing an alternative way to move text around
- On screen Help - full documentation in a scrollable window
- Instant file info feature, and current directory setter
- Caret flash controller for DeskEdit and other applications
- Customised user commands to open directories, run other applications and launch Obey files
- Numerous keyboard shortcuts
- Fast text printout including style codes for bold, underline, italics, page breaks etc
- Special text printing options with headers, footers, page numbering and style codes.
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Language specific features:

Plain text

- DeskEdit will format word-wrapped text as you type

Basic

- Drag a Basic file to the icon, and it will automati-cally be detokenised and loaded into DeskEdit ready for editing. Press F3 to retokenise and save it after editing.
- Optional line number stripping.
- Auto indent, automatic line number insertion, and checking for matched brackets and quotes - as you type.
- ***Special Basic browser:***
  Ctrl R steps through all REM lines
  Ctrl D steps through all procedure and function definitions
  Ctrl P steps through all procedure references
  Ctrl F steps through all function references

C language

- A simple syntax checker which operates as you type.
- Auto indent facility combined with automatic generation of opening braces streamlines source code entry.
- ***C Function browser***
  Ctrl-F steps through function definitions.

DeskEdit is supplied with a 48 page manual and a function keystrip. Members' Price **£19.95** inc. VAT. + p&p Stock Code **PEDTb**

Existing users may upgrade to V. 1.20 by sending their original disc, together with £2.00 and SAE marked **DeskEdit Upgrade 1.2.**

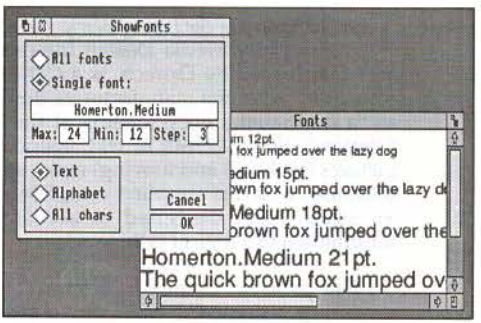
RISC Developments Ltd.
117 Hatfield Road, St Albans, Herts, AL1 4JS.
Tel. 0727 40303 Fax 0727 860263

Outline Font Displayer

by Mark Moxon

There are so many outline fonts available that sometimes it can be quite a headache trying to choose the right one for the right job. The ShowFonts application, specially written for the RISC User disc, allows you to display text in selected fonts from your collection, either in an automatically resized window in the Desktop, or on your printer, thus enabling you to keep track of your font collection.

You can display every font on your machine in any size you want, or you can display one font in a range of sizes. Various character ranges can be displayed for each font, either showing text to give an idea of what the font looks like in English, or showing the entire character set.



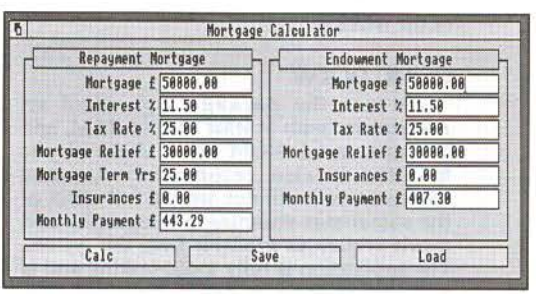
ShowFont in action

The application is fully multi-tasking, and all selections are chosen from an easy to use dialogue box and menu. Now choosing the right font is child's play. RU

Mortgage/Loan Calculators

by Tony Shew

With the recent trend to change mortgage interest rates every few months, it's nice to be able to calculate how much you are going to have to pay. This home finance application will do this for you, as well as allowing you to do 'what if' calculations on different interest and tax rates. The application will also work out the cost of credit card and personal (bank) loans.



Mortgage calculator display

Finance is a multi-tasking application that sits on the icon bar and has separate dialogue boxes to calculate endowment and repayment mortgage payments, credit card costs, and personal loan payments. Simply enter the details of your mortgage, credit card or personal loan and the answers are immediately calculated for you.

The dialogue boxes have icons to save and load data to disc files to allow you to keep details of your calculations without needing to re-enter them every time the application starts. Full instructions are included with the application. RU

For reasons of space, these applications are only available on this month's magazine disc.

Dictionary of the Living World

Alan Wrigley reviews an exciting new multimedia product for the Archimedes.

The *Dictionary of the Living World* (DOLW), produced by Media Design Interactive and distributed by Optech, is a CD-ROM containing what the manufacturers describe as "a multimedia encyclopedia of the Life Sciences". Some 329Mb of text, sound and pictures (both still and moving) make up the database, which is supplied complete with an application designed to access the information in a logical fashion.

The product comes in a smart pack containing a single CD-ROM plus a manual which is nothing more than a single-sheet reference card. Initially this comes as something of a shock, but in fact a manual is really unnecessary since the application is so intuitive to use that it takes about 5 minutes to master it completely. This makes it particularly suitable for occasional users, for example in school libraries, where the information can be retrieved as quickly as by looking it up in a conventional encyclopedia. A simple help facility makes life even easier: clicking on the help icon on any screen displays a set of labels which indicate the function of each icon or section of the window.

USING DOLW

To use the package, you need an Archimedes with at least 2Mb of RAM, and of course a CD-ROM drive. A multisync monitor is also recommended, since otherwise you will not see the full effect of the sometimes stunning photographs and movie sequences available from the system. The application is fully multi-tasking and is installed on the icon bar in the usual way. All the information is shown in a single display window.

To get started, you just click on the index icon, which displays the main index in the window (shown in Figure 1). This consists of a list of the 1007 entries in the encyclopedia, from *Aardwolf* to *Zygotene* via *Cytoplasm*, *Lepidoptera*, *Macroevolution*, *Sumatran Rhinoceros* and so on. Clicking on any item displays the card entry for that subject (see Figure 2). This will always contain a textual description of the item, but may also include a picture. Some entries may also have an associated sound sample, a moving picture sequence, or (if a living creature) its distribution depicted on a very attractive map of the world. Icons in the main index indicate whether any particular entry has any of these elements.

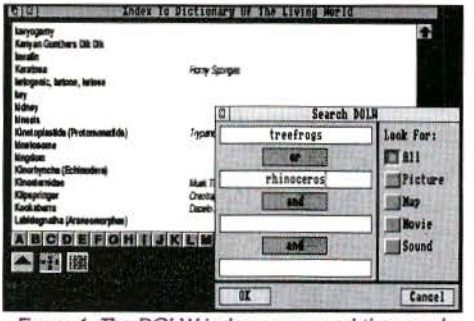


Figure 1. The DOLW index screen and the search dialogue box

The text for each entry is clear, concise and easily understood, making the encyclopedia perfectly suitable for educational use (Media Design Interactive suggests it is suitable for pupils of 10 years and upwards). I am not a scientist and cannot therefore comment on the accuracy of the text, though I understand the whole database was compiled from scratch by a professional biologist.

Once a card entry is displayed, clicking on the appropriate icon will play the sound sample or run the movie, if there is one for that entry. The sounds are very realistic - for example, a dog barking sent my cats scurrying for the door! The movies range from simple short sequences with the camera panned across a fairly immobile creature, to quite amazing shots of animals engaged in some form of activity: for example, the Sumatran Rhino movie lasts a full minute and a half and shows the rhino romping about in a zoo, being sprayed with water and splashing in a pool. A few movie sequences even have soundtracks.

SEARCHING

A simple but effective search facility is provided. Clicking on the search icon brings up a dialogue box (see Figure 1). You can search on four keywords using AND, OR or NOT logic, and you can search through all entries or restrict the search to those which have a sound, picture, movie sequence or map. All matching entries are then placed into a subsidiary index, and once a search has been made this index can be displayed on screen at any time and used in exactly the same way as the main index to access the card entries.

EXPORT

Most of the database elements can be exported into other applications or saved as files. The text in a card entry can be saved as a text file, while if there is a picture present it can be saved as a sprite in one of two sizes. A sound can be saved either as a sound module or as a sample, while a movie sequence can be exported as an Acorn Replay movie (see below). You can also save the subsidiary search index as a text file, and a distribution map if there is one as a sprite.

ACORN REPLAY

I have talked about movie sequences so far in this review in a rather matter-of-fact way. We are all used to the amazing capabilities of the Arc, but in fact the technical hurdles to be overcome in order to display real-time moving images are quite considerable. The problem is not so much one of space, since CD-ROMs can hold a vast amount of data, but of transfer rate between ROM drive and computer.

Acorn's *Replay* is an application designed to overcome these difficulties, and has been produced specifically for developers of CD-ROMs. There is not space here to describe it in detail, but it makes use of some clever compression techniques. When the movie sequence is prepared for the CD-ROM at the manufacturing stage, a certain amount of detail which is invisible to the eye is removed from each frame, and then only those parts of the image which actually change from frame to frame are stored. This allows much more information to be stored on the CD-ROM, and more importantly still, allows a much higher transfer rate from CD-ROM to computer. The *Replay* software which is then supplied with the application reconstitutes the moving image from the compressed data on the ROM. It is noticeable with DOLW that the colour quality of the movie sequences is not as good as the still pictures, but this is a small price to pay for achieving something which could not otherwise be done.

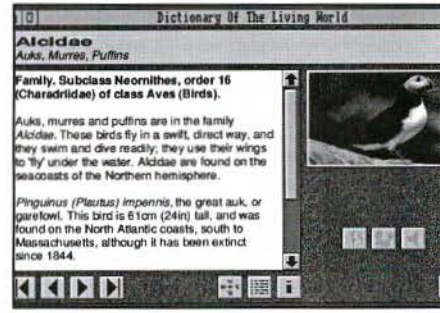

Dictionary Of The Living World
Alcidae
Auks, Murres, Puffins
Family. Subclass Neornithes, order 16 (Charadriidae) of class Aves (Birds).
Auks, murres and puffins are in the family Alcidae. These birds fly in a swift, direct way, and they swim and dive readily; they use their wings to 'fly' under the water. Alcidae are found on the seacoasts of the Northern hemisphere.
Pinguinus (Plautus) impennis, the great auk, or garefowl. This bird is 61cm (24in) tall, and was found on the North Atlantic coasts, south to Massachusetts, although it has been extinct since 1844.

Figure 2. A typical card entry displayed by DOLW

CONCLUSIONS

Acorn is trying hard to push CD-ROM as an ideal vehicle for multimedia software, and this is certainly the best example I have seen. It is possibly the first true multimedia CD-ROM for the Archimedes market, combining text, sound, pictures and movies in an extremely user-friendly package that must surely show the way for other similar projects.

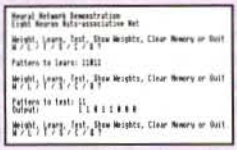
In one or two instances my machine hung when trying to access an entry from the index, suggesting that the software is perhaps not always as robust as it should be. This did not happen often and was really only a minor irritant, but it could be annoying if you have unsaved data on the Desktop. Apart from that I encountered no problems and found the whole package a delight to use.

Product	*Dictionary of the Living World*
Supplier	*Optech Ltd.* *East Street, Farnham,* *Surrey GU9 7XX.* *Tel. (0252) 714340.*
Price	*£205.63 inc. VAT.*

Further CD-ROM titles are scheduled from Optech later this year. RU

RISC User Disc Contents Augu

Neural Networks

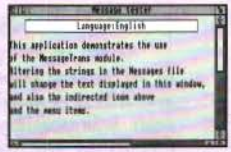

Neural Network Demonstration
Light Neuron Auto-associative Net
Weight, Learn, Test, Show Weights, Clear Memory or Quit
W / L / T / S / C / Q ?
Pattern to learn: 11011
Weight, Learn, Test, Show Weights, Clear Memory or Quit
W / L / T / S / C / Q ?
Pattern to test: 11
Output: 1 1 0 1 1 0 0 0
Weight, Learn, Test, Show Weights, Clear Memory or Quit
W / L / T / S / C / Q ?

A simulation of learning and pattern recognition processes which occur in the human brain. The program implements a simple auto-associative neural network with just one layer of 8 neurons, as described in the article in this issue. The network uses the Hebbian rule to learn to recognise patterns, which are entered as sequences of zeros and ones. The program can be taught more than one sequence, and if an initial segment is entered which matches a learnt pattern, then the whole pattern will be displayed. Considering the small size of this program, the effects are most impressive.

Printing for Part-time Programmers

This program allows screens to be dumped to Epson compatible printers with the minimum of fuss. A number of procedures are provided which allow the whole screen to be dumped, or just a window in the Desktop, and they provide a much simpler (but more primitive) way of printing the screen than interfacing with the printer drivers.

MessageTrans Demonstration Application

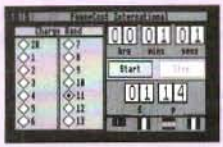

Message Editor
Language:English
This application demonstrates the use of the MessageTrans module.
Altering the strings in the Messages file will change the text displayed in this window, and also the indirected icon above and the menu items.

This application demonstrates the use of the MessageTrans module from within Basic, as described in the magazine; the module is also included on the disc under licence from Acorn. The application reads from a messages file, which contains a number of text items, and displays these lines in icons and menus on the Desktop. Changing the messages file will change the text displayed on screen, thus showing how applications can be made international.

Wimp Function/Procedure Library (Part 4)

The complete Wimp library program is included on the disc. Due to the nature of this month's additional routines, there is no example application.

Telephone Call Coster

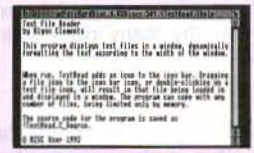


This application is designed to provide a quick and easy way to cost telephone calls. The version on the magazine disc contains extra features, and can cost international calls as well as standard inland calls. The application works via a window on the Desktop, which dynamically displays the length and cost of the call, and all the costs are calculated at the correct charge band depending on the setting of the computer's internal clock.

Using ANSI C (Part 13)

This example application demonstrates how to use dialogue boxes in C to display text in a window. A window with twenty-five text lines is displayed on the Desktop, and the program demonstrates how to write to these text lines. The source is, as always, included with the application.

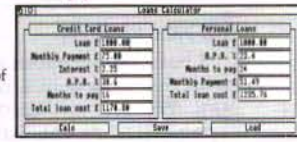
Text File Reader


Text File Reader
by Dixon Clements
This program displays text files in a window, dynamically formatting the text according to the width of the window.
When run, TextRead adds an icon to the icon bar. Dragging a file icon to the icon bar icon, or double-clicking on a text file icon, will result in that file being loaded in and displayed in a window. The program can cope with any number of files, being limited only by memory.
The source code for the program is saved as !TextRead.C.Source.
© RISC User 1993

To complement the ANSI C application, this application displays text files in a window, dynamically formatting the text according to the width of the window. The source code (which is included) shows how to display text in a window without using icons in a dialogue box. This application code lies at the heart of the RISC User disc menu system.

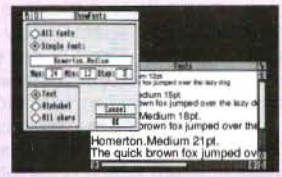
ADDITIONAL ITEMS REFERRED TO IN THE MAGAZINE

Home Finances Application



This is an application to help you determine some of your home finances, and will calculate your monthly mortgage payments (both endowment and repayment types), and personal and credit card loans. The calculations are all performed in a Desktop window, and details can be saved to disc to avoid having to retype them each time the application is run. The C source code for the application is also included on the disc.

Outline Font Displayer



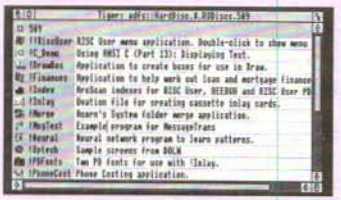
This application allows outline fonts on your system to be displayed on screen and printed out for reference. This enables the large number of outline fonts available to be managed more easily. You can either display the whole range of fonts on your machine at a specific point size, or you can display just one font in a range of sizes. The fonts are initially displayed in a window, and can then be printed out via the RISC OS printer drivers.

All the applications in this month's magazine

t/September 1992

BONUS ITEMS

Tiger 2: Detailed Catalogue Application



Tiger 2 is an updated and rewritten version of the Tiger application originally published on the RISC User disc for Volume 3 Issue 10. Tiger implements a directory display which acts in a similar way to the Filer window, but associated with each entry is a decription which you enter and which is stored within a specific Tiger data directory. The application is fully multi-tasking, and an example Tiger data directory is included on the disc to help show you how to organise your own discs. A most useful and well presented application.

Ovation Cassette Inlay Template

This Ovation document contains templates for creating audio cassette inlay cards, using two public domain fonts (Revue and FritzQuadr) which are also included on this disc. The templates allow you simply to click and type, and the sizes have been calculated so the resulting printout will fit the cassette case exactly. A number of paragraph styles are defined to ease use, and the results give your tape

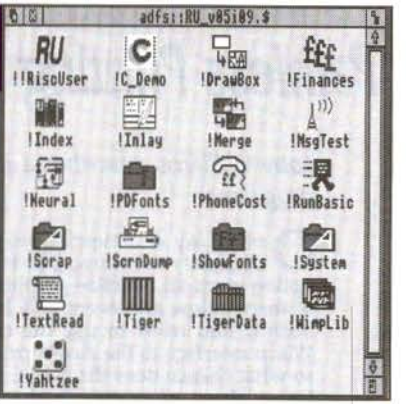
Desktop Yahtzee

A RISC OS compliant version of the classic dice game, complete with animated dice and a high score table. Perfect for those lazy afternoons!

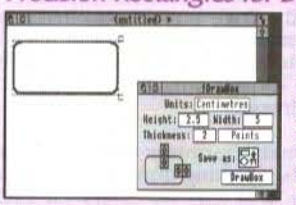
ArcScan Data

ArcScan indexes for this issue of RISC User, BEEBUG Vol.11 No.3 and a new index for our Public Domain library.

This month's disc menu



Precision Rectangles for Draw



This application can be used to create a rectangle of precise size for importing into Draw or a DTP package. Although it is possible to define the size of a box accurately using Draw, it is somewhat fiddly, and this application allows the dimensions of the rectangle to be entered in centimetres, millimetres, inches, fractions of inches, points (1/72 of an inch) or pica ems (12 points). The thickness of the box outline can be specified, and the rectangle can also have curved corners - something which is very tricky to achieve in Draw.

RunBasic: Run Basic Text Files

Basic files can be created in Edit, but they cannot be double-clicked to be run, but must be loaded into Basic first. This application sits on the icon bar and will execute any text files containing Basic programs that are dragged to it. This is a very simple application that can save time and energy, and will help those who do not have a multi-tasking Basic editor in using the resources they already have.

Revue and FritzQuadrata Fonts

REVIEW - ABCDEFGHIJKL
MNOPQRSTUVWXYZabcdefg
hijklmnopqrstuvwxyz
FRIZ QUADRATA -ABCDEFGH
IJKLMNOPQRSTUVWXYZabcdef
ghijklmnopqrstuvwxyz

Two public domain fonts for use with the Cassette Inlay template or with any application which uses fonts.

and a selection of bonus items for only £4.75

Painless Printing for Part-time Programmers

Toby Williams describes a simple graphics print procedure to use in your own programs.

One of my commercial programs has a text-only window, but its hardcopy option gives an oversize graphics rendering of the window and eventually hangs up. Its author had tried to use the complicated Wimp interface to the Acorn printer drivers, so what chance does the casual programmer have, short of grabbing the screen and printing it via Paint?

Luckily, there is a simple alternative for programmers who just want to print black and white graphics in a non-multi-tasking manner. Try this out, if only to learn more about printers!

Dot matrix printers write columns of 8 or 24 dots, scanning from left to right across the page. It is only necessary for each dot group to read the corresponding dot colours from the screen and decide which to print as black and which are white. The resulting dot column is assembled as a byte representing each group of 8 dots, and is sent to the printer. This is repeated in a series of left to right scans from top to bottom of the screen.

Each line begins with a code announcing the start of a graphics scan, specifying the dot density and how many bytes make up the line. You must reset the printer first, and you must set the linefeed step to 8 dots. All that remains is to turn printing on and off, with VDU 2 and VDU 3.

The essential instructions are in the listing below. Each '1' following a VDU instruction announces a code sent to the printer but not to the screen. Type the following listing carefully using exactly the same line numbers, and save it as *Scrn_Dump1*.

This should work for any printer emulating an 8-pin Epson; for other printers, make yourself comfortable and read your manual!

Listing 1

```
10 REM              >Scrn_Dump1
20 REM Program      Screen dump
30 REM Version      A 1.01
40 REM Author       Toby Williams
50 REM RISC User Aug/Sept 1992
60 REM Program   Subject to Copyright
70 REM           NOT Public Domain
80 :
90 ON ERROR VDU4,1,27,1,64,3:REPORT:P
RINT" at line ";ERL:END
100 PROCprint(0,600,1279,1023)
110 END
120 :
130 DEF PROCprint(X0%,Y0%,X1%,Y1%)
140 LOCAL D%,BS%,YC%,YY%,ZZ%,C%,XS%,YS
%,M%,N%,DPI%,INCHES%,b%,x%,y%,z%,bb%,yy%
150 D%=1:BS%=2:YC%=32:YY%=31:ZZ%=0
160 C%=6:XS%=2:YS%=4:M%=0
170 N%=1+((X1%-X0%) DIV XS%)
180 :
190 REM leave space here...
290 :
300 VDU 2,1,27,1,64:REM printer on, re
set
310 VDU 1,27,1,65,1,8:REM linefeed 8 d
ots
320 :
330 FOR y%=Y1% TO Y0% STEP -YC%
340 :
350 VDU 1,27,1,42,1,D%,1,N% MOD 256,1,
N% DIV 256:REM start line, give byte cou
nt
360 FOR x%=X0% TO X1% STEP XS%
370 :
380 b%=0:REM build printer byte
390 FOR bb%=y% TO y%-YY% STEP -YS%
400 b%=b%*BS%
410 IF POINT(x%,bb%)>C% THEN b%+=1
420 NEXT bb%
430 VDU 1,b%
440 :
450 NEXT x%
460 VDU 1,10:REM linefeed
470 NEXT y%
480 VDU 1,27,1,64,3:REM reset, pr. off
490 ENDPROC
```

HOW IT WORKS

The screen window to be printed by *PROCprint* is described by the parameters X0%,Y0%,X1%,Y1%. The variables set up in lines 150 to 170 have the following meanings. C% is the colour threshold above which a dot is printed; 6 is a good value for a 16 colour screen. XS% and YS% determine

the horizontal and vertical screen reading resolution, which can be calculated for a certain mode by the following:

```
XS%=1280/horiz pixel resolution
YS%=1024/horiz pixel resolution
```

so for mode 12 XS%=1280/640=2 and YS%=1024/256=4.

BS% shifts the byte one bit after setting the bottom bit, and YC% is the height of each scan column. N% is calculated to the exact number of graphics bytes per line; no more, no less. Finally D% is the print density: to fit a normal screen across A4 paper, this is 1 for full resolution double density, or 2 for draft mode.

In mode 12, type *Scrn_Dump1* from the command line (press F12), assuming it is in the currently selected directory. If this succeeds in printing, read on...

24-PIN PRINTERS

With A4 paper, wider screens such as mode 16 and 17 need to be rotated 90 degrees (scanned downwards instead of sideways) or scaled down. Two-thirds scale at full resolution is obtained by using triple density and 12 alternate pins of a 24-pin printer (BS%=4).

For triple density, 3 vertical bytes must be assembled at a time, so another variable z% is introduced as follows:

```
150 D%=39:BS%=4:YC%=48:YY%=15:ZZ%=32
370 FOR z%=0 TO ZZ% STEP 16
390 FOR bb%=y%-z% TO y%-z%-YY% STEP -YS%
440 NEXT z%
```

Add the above lines to the listing and save the new program as *Scrn_Dump2*, and run it. If all is well, you may decide to stick with what you have saved so far. But if this has whetted your appetite, read on...

TIDYING UP THE PROCEDURE

If your printer does bi-directional printing but produces ragged edges, you can force uni-directional printing with this line:

```
320 IF D%<>2 THEN VDU 1,27,1,85,1,1
```

A margin of M% dots (calculated at 60 dots per inch) can be set as follows:

```
340 VDU 1,27,1,36,1,M% MOD 256,1,M% DIV 256
```

You can add the following lines to calculate M% automatically to centre the image, check against the paper size limit, and choose triple density if necessary. Retype the original line 150, then this:

```
190 DPI%=120:INCHES%=8
200 M%=240*(1-N%/(INCHES%*DPI%))
210 IF M%<0 THEN
220REM didn't fit, so triple density
230DPI%=180:D%=39
240BS%=4:YC%=48:YY%=15:ZZ%=32
250N%=1+((X1%-X0%) DIV XS%)
260M%=240*(1-N%/(INCHES%*DPI%))
270 ENDIF
280 IF M%<0 THEN VDU4:PRINT"Too wide
for printer":ENDPROC
```

FINDING THE WINDOW SIZE

The whole screen can be printed by adding and using the following routine:

```
500 :
510 DEF PROCprint_screen
520 LOCAL
x_eig,y_eig,x_pixels,y_pixels
530 LOCAL x0%,y0%,x1%,y1%
540 SYS "OS_ReadModeVariable",-1, 4
TO ,,x_eig
550 SYS "OS_ReadModeVariable",-1,11
TO ,,x_pixels
560 SYS "OS_ReadModeVariable",-1, 5
TO ,,y_eig
570 SYS "OS_ReadModeVariable",-1,12
TO ,,y_pixels
580 x0%=0:x1%=(x_pixels+1)*(2^x_eig)
590 y0%=0:y1%=(y_pixels+1)*(2^y_eig)
600 PROCprint(x0%,y0%,x1%,y1%)
610 ENDPROC
```

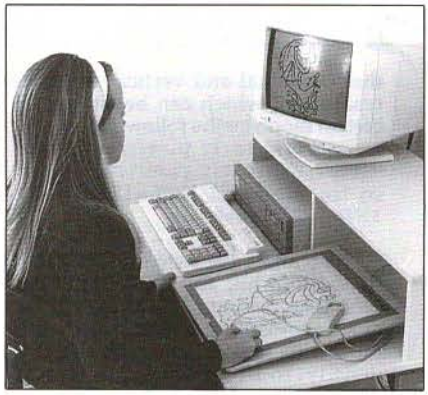
The contents of a Wimp window can be printed by adding the following lines and calling *PROCprint_window* with the relevant window handle:

```
620:
630 DEF
PROCprint_window(WindowHandle%)
640 LOCAL blk%:DIM blk% 36
650 LOCAL x0%,y0%,x1%,y1%
660 !blk%=WindowHandle%
670 SYS "Wimp_GetWindowState",,blk%
680 x0%=blk%!4 :y0%=blk%!8
690 x1%=blk%!12:y1%=blk%!16
700 PROCprint(x0%,y0%,x1%,y1%)
710 ENDPROC
```

You can add these procedures to your programs, or put them in your library, to enable your programs to dump out screens or parts of screens easily.

RU

THERE ARE TIMES WHEN A MOUSE IS A REAL HANDFUL!



A mouse is great as a pointing device, but when it comes to freehand drawing in art packages, accurately tracing drawings, or mapping contours, etc., it can prove a real handicap. The TechSoft HANDIPAD digitizing tablet is an absolute device. Unlike a mouse, the puck's position on the tablet always corresponds to the cursor position on screen. The puck has cross hairs for accurate tracing. Alternatively, the pen-like stylus can be used to allow a much more natural drawing action, far better for artistic and freehand work. The stylish Handipad has a 305x305mm active area, transparent overlay sheet to place drawings under, and comes complete with mains power supply, puck, stylus and serial cable. (Makes a great mouse mat too!)

TECHSOFT HANDIPAD

Archimedes Compatible *The mouse emulation software module provided is compatible with most software applications. The module allows both mouse and tablet to be active (by simply moving the puck off the active area the mouse re-gains control). If a small drawing is to be traced, clicking either side of the drawing with the fourth puck button "zooms" this area to fill the screen.*

TECHSOFT UK Ltd., Old School Lane, Erryrys, Mold, Clwyd, CH7 4DA Tel: 082 43 318 Fax : 082 43 564 **TECHSOFT HANDIPAD** **£175** +£8 p & p +VAT

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Tel. 051 327 4268.

JPEG File Compression

Alan Wrigley reviews DT Software's image compression package.

JPEG is an image compression standard formulated by the Joint Photographic Experts Group and designed specifically to compress photographic images to facilitate easier storage and transfer of files containing such images. DT Software's *JPEG* is a multi-tasking application which will compress an existing image file (from any of a number of formats) into a JPEG file, and decompress JPEG files into any one of the same formats.

The compression method used in the JPEG standard is significantly different from other methods such as LZW. It removes redundant information from the compressed image, relying on the accuracy of the algorithm to remove only parts which are unlikely to be visible to the eye. For this reason, it can only be used as an image compressor, since the reconstituted data is not exactly the same as the original. It would be pointless using it to compress a Basic program or a text file, for example.

DT Software claims that *JPEG* can reduce an image to around 4-7% of its original size with no loss of perceived image quality. Clearly this is useful not only to save space on a hard disc, but also to make it possible to transfer a large image from one system to another on a floppy.

USING JPEG

To compress an image, you simply drag the image file to *JPEG*'s icon bar icon. The software supports a range of standard file formats, including GIF, Clear and of course RISC OS sprites. The main window offers a number of options which may be set before the image is compressed, including an image quality setting. This allows a trade-off between image quality and size of compressed file. A sensible default is provided. The compressed image is then saved in JPEG file format using a menu option.

The decompression routine is just as straightforward. Double-clicking on a JPEG file loads it into *JPEG* ready for decompression. More options are available, including Floyd-Steinberg dithering, and greyscale output if colour is not required. The decompressed image can now be saved in any of the formats recognised by *JPEG*.

RESULTS

I tried compressing into the JPEG format a number of 256-colour sprites containing good-quality images which had been scanned from photographs, and then decompressing the JPEG files back into sprites. I have to say that in my experience DT Software's performance claims for *JPEG* are well wide of the mark. Most of the compressed files were around 25-30% of the size of the originals - much larger than the 4-7% claimed (though a compression ratio of 4:1 is still a significant reduction in size). In one case I managed 15%, but that was an image somewhat lacking in fine detail. Not only that, but the image quality in every case was noticeably poorer when the image was decompressed. Colours came out mottled or blotchy, and there seemed to be an overall magenta cast in most cases.

Initially disappointed with the results, I tried increasing the image quality setting to its maximum. This produced a "compressed" file 30% *larger* than the original image, and the quality was still no better! Several discs of JPEG and GIF images are provided with the software as examples, but without the original images it was impossible to comment on the effectiveness of the compression. However, using *ChangeFSI* to convert one of DT's GIF files into a sprite produced a better result than compressing and decompressing it with *JPEG*. Of course, there is no way of telling whether these shortcomings are due to the JPEG standard itself or to DT Software's implementation.

In short, if you want to compress images for non-critical purposes (for faxing, for example) then *JPEG* will probably reduce the size by more than other methods. But if you want to retain the image quality I cannot recommend it.

Product	*JPEG*
Supplier	*DT Software* *FREEPOST,* *Cambridge CB3 7BR* *Tel. (0223) 841099*
Price	*£89.95 inc. VAT.*

RU

WP/DTP

Improving graphics in DTP

Roger Amos gives some hints and tips on the handling of graphics in Ovation (and other DTP packages too).

GRAPHIC DESCRIPTIONS

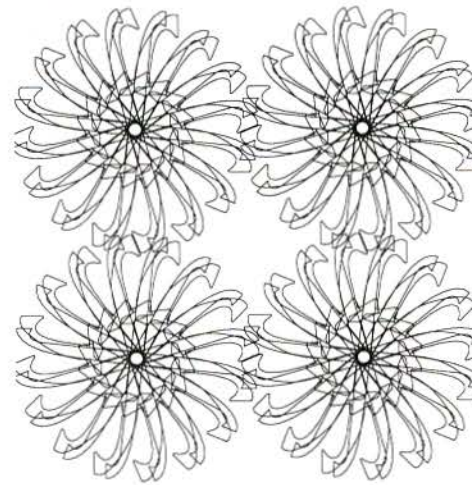
Recently there has been a profusion of new drawing packages for RISC OS machines. 4Mation's Vector (see review in this issue) and Computer Concepts' ArtWorks have received much publicity. More quietly last year, Jonathan Marten's DrawPlus became available through PD and shareware outlets, and purchasers of Acorn's new A5000 found that the version of Draw contained in that machine's ROM offered many significant improvements over the original RISC OS 2 version (see review in RISC User 5:3).

Ovation, like other DTP packages, can handle Draw files in its picture frames. But what about the stunning graphics now being created by the sophisticated new generation of drawing software? Can these also be imported into Ovation?

The answer is "yes", but subject to certain restrictions. All the drawing packages offer the option to save work as Draw files, and you must of course use that option. And your drawing should contain no objects of alien 'type'. The Draw file rendering routines in Ovation, like those in the original version of Draw, recognise only five object types: path objects (vector graphics), text objects, text areas, sprites and groups.

So if you were to save a Vector file in Draw format which contains other types of object - for example, Vector's replications, radiated objects or mask objects - these would not be reproduced.

The problem can sometimes be overcome, however. Vector contains routines that convert some of the new object types, such as replications and radiations, into conventional path objects. In this form they take up more memory, but they are of course reproduced normally in Draw and in Ovation and other DTP packages. Sadly there is nothing that can be done about masks.



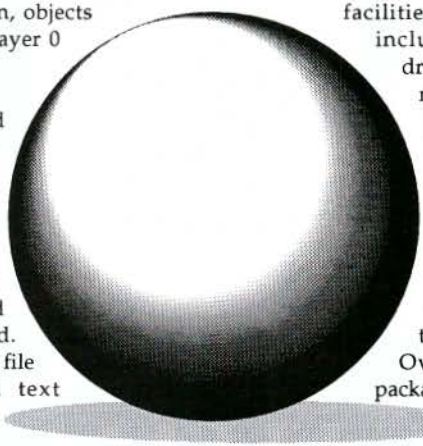
A Vector drawing consisting of a Paladin 'f' that has been first radiated and then replicated - this drawing can be made compatible with Draw and DTP packages by converting to conventional path objects. Vector's mask objects, however, cannot be made compatible.

Even the version of Draw supplied in the A5000 (version 0.87) can cause object "type" difficulties since, whenever it saves a file, it stores the current zoom and other settings as a special invisible object located in the bottom left-hand corner of the drawing. Normally this causes no problems when imported into Ovation, but occasionally it interferes with other nearby objects, causing them to disappear. You can eliminate this object by first saving the file

into DrawPlus or Vector, and then resaving it. There is also a public domain application called *Dook* which strips this object out of Draw files.

Unrecognised structures such as *layers* cause similar problems. If you import a DrawPlus file in the "new format" into Draw or Ovation, objects on all layers except layer 0 will be invisible.

Unrecognised styles are similarly ignored. In Draw 3 (the name popularly being applied to versions of Draw supplied with RISC OS 3), text objects and sprites can be rotated. If you import a Draw file containing rotated text or sprites into Ovation, the rotated objects will be invisible (a new version is on the way which will reproduce rotated text and sprites). Even if you try to print the drawing direct from Draw 3 but using a printer driver developed for RISC OS 2, you may find that your text or sprite is printed but with a horizontal orientation; the rotation data was ignored. For the time being you will need to continue to convert text objects to path objects if you wish to rotate them and import them into Ovation. And you will need to rotate sprites in Paint before transferring them to Draw or DTP packages.



You don't need Chameleon 2 or ArtWorks to make use of graded colour fills (although they make them very easy). This sphere was created using Draw 3's Grade facility which produces extra intermediate objects and so is compatible with all packages. The illusion of depth is enhanced by RISC OS 3's dithering which provides many extra shades. Ovation can use RISC OS 3's dithering in its rendering of Draw files.

ALL OF A DITHER

One of the many appealing features of RISC OS 3 is that it provides dither patterns - chequerboard-style patterns of pixels in two or three colours - to simulate colours not otherwise available from the palette. In 16-colour modes hundreds of different colours are possible, and in 256-colour modes this rises to thousands.

Combined with the interpolation facilities and graded colour fills included in many recent drawing packages, dithering makes subtle shading possible, and gives the creator of vector graphics access to the kind of "photographic" realism seen in the best sprite-based computer art. And since these techniques use conventional path objects, they are compatible with Ovation and other DTP packages.

Ovation can use RISC OS 3's dithering in its rendering of Draw files. To make this possible you will need to amend a line in Ovation's *!Run* file. Drag the file into Edit and find the two lines shown below:

```
| Uncomment the next line to enable
Dithering in Draw file rendering
| Set Ovation$Dither 1
```

To "uncomment" the line simply delete the bar character at the start of the second line. Then resave the file. When next you start up Ovation you should find that any Draw graphics which use colours not available in the current palette are dithered to simulate those colours. The latest release of Ovation (v1.30 or later) handles this automatically.

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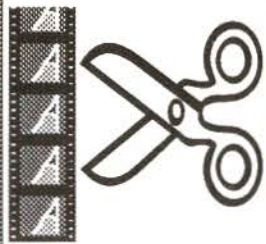

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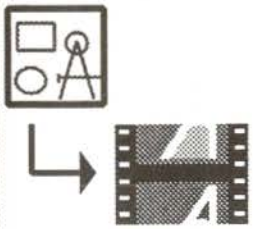

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UNCOMMON RENDERING

If you import a Draw file into Ovation and use the X and Y scale facilities in the *Modify Picture Frame* dialogue box to magnify the picture significantly, you may find that the on-screen rendering is distorted. In general curves can appear to be successions of straight lines and line thicknesses are wrong. The graphics print out quite correctly, however, and that is what really matters.

If the appearance of the graphics on screen is important to you, there is a solution. Return to the graphics package and magnify the whole drawing by whatever scale factor you previously applied in Ovation. Then import the magnified graphics back into the Ovation picture frame. It should then look as good in Ovation as it did in the original package. Again the latest release of Ovation has improved the rendering of Draw files, and it is now significantly faster as well.

FRINGE AREAS

The printing of sprites, whether imported into DTP packages or Draw files or straight from Paint often causes difficulties. One common problem is the appearance in the printout of unsightly tartan or or chequerboard-like patterns criss-crossing the entire sprite.

The problem seems to be particularly acute when the sprite is an image from a scanner. Some scanner driver software reproduces colours or grey tints using "clustered dot dithers" and this sometimes aggravates fringing problems.

The problem really originates from the fact that RISC OS assigns high-definition sprites a nominal pitch of 90 pixels per inch (to match the mode 18-21 screen). Consequently images scanned at 300 dots per inch are regarded as over three times their natural size and must normally be rescaled in the DTP package to fit the space available. The problem is the ratio at which to rescale.

If you intend to print the document on a 300 dots per inch printer, the ideal is to restore the image to its original size, so that there will be an exact dot-for-dot correlation between the scanned image and the printed image. The reduction ratio is therefore 90:300 or 30%. In Ovation set the scaling factor to 30% on both axes and you should obtain a clean print-out that is exactly the same size as the original. So far so good.

But if you had scanned at 400 dpi, all would not be so good. To restore the image to its original size now requires a scaling ratio of 90:400 or 22.5% and some packages, including Ovation, do not handle fractional percentages. If you use 22% or 23%, the error, although small, will introduce fringes. But you could treat it as though it had been scanned at 300 dpi and scale it to 30%. Because this restores the dot-for-dot correlation if not the size correlation, you will obtain a clean printout that is one third larger than the original.

When you scale a sprite by an awkward figure like 13%, you lose the dot-for-dot correlation between the input data (from the scanner) and the output device (the printer). The computer has to decide which adjacent pixels in the sprite it will combine to fit the pixels available on the output device. With an inconvenient figure like 13% the number of pixels merged will vary from one part of the sprite to another. This alone can cause interference fringes in many kinds of sprite.

That is not to say that you should never scale sprites which you intend to print. But you need to be aware of the system's limitations. The secret of success is to confine the scaling of sprites to simple multiples of the full-size ratio. If you scanned at 300 dpi, keep to 15%, 30%, 45% and 60%. But don't be afraid to experiment.

MORE FRINGES

Computer Concepts' Laser Direct Hi-Res certainly offers exceptional printing power at a reasonable price. At 600 dots per inch its text and solid shapes have beautifully smooth outlines with no trace of the dreaded "jaggies". But some users have been disappointed by its rendering of tints at 600 dots per inch. Although delightfully smooth at 300 dots per inch, at the higher resolution they are uneven and prone to unsightly streaking.

The explanation is that the Canon LBP-4 was never really intended for printing at 600 dots per inch; that it can do so at all is a matter of software ingenuity rather than hardware design.

But there is a simple trick that you might like to try. If you open the front of your printer (where you put the toner cartridge) you will find a sliding exposure control. If you have not yet touched this, it will probably be set to its mid point. Turn it down to about 25% and try a few printouts at 600 dots per inch. The chances are you will find a very worthwhile improvement.

There is, as ever, a catch. At this low setting printouts made at 300 dots per inch will look rather pale. In this life, I'm afraid, you can't have everything!

Note: a new release of Ovation (version 1.30) is now available (see advert in this issue) which contains a range of improvements including the capability to take full advantage of RISC OS 3 features. A facility to import Vector files is currently under consideration.

RU

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Managing Assembler

Mark Moxon explains how to use Basic libraries to modularise your assembly language programming.

The Basic LIBRARY function is an excellent addition to BBC Basic, and allows programs such as the RISC User Wimp Function/Procedure Library to be created. The same concept can be stretched to assembly language programming to allow useful routines to be put into separate Basic programs, which can then be included using the macro facility. In this article I will explain my approach to this method which makes programming large assembly programs much more manageable and has many advantages over using one long source code; for example, if you are using a multi-tasking editor in the Desktop, it is easier to open windows for only those parts of your code you are working on, without having to resort to the *New view* option.

In order to utilise assembly libraries in Basic, the Basic Assembler's *macro* facility must be used. This facility is not built-in as such, but due to the clever integration of the Assembler with Basic, macros can be implemented easily. A macro is a piece of code that is given a name, and whenever that name occurs in the assembly source code, it is expanded to the contents of the macro. Macros can also take arguments, so for example if the macro *div(r,n,d)* took three arguments (the result, numerator and denominator registers) and expanded into code to perform r=n/d, then div*(R1,R2,R3)* would expand into code to perform R1=R2/R3, and *div(R10,R12,R7)* would expand into code to perform R10=R12/R7.

Macros in Basic can be implemented by functions that return empty strings. There must be a universal variable that denotes the current OPT option (I use *pass%*), so the macro definition takes the form:

```
DEF FNdiv(r,n,d)
[ OPT pass%
...
code to do division
...
]
=""
```

Then the division macro can be expanded easily in normal assembly code by the following, for example:

```
[
...
FNdiv(R1,R2,R3)
...
]
```

Now to our modular approach to assembly language programming. Put groups of routines that you wish to modularise into separate programs in the form of macros, so the library programs simply contain function definitions. You can call any macro from any program, but obviously if you wish to retain flexibility, interdependency should be kept to a minimum. Now write your main source program that sets up your memory areas and the double-pass loop etc., and at the start put a line of the form:

```
LIBRARY "filename"
```

for each library program you wish to use. Next set up an Obey file called *!Compile* containing the following lines:

```
Dir <Obey$Dir>
Run <Obey$Dir>.MainProg
```

where *MainProg* is the name of your main program. This is necessary to enable the libraries to be found. Make sure all these parts of the setup are saved in the same directory, and now double-clicking on !Compile will run the source program and assemble your code.

A useful application of this method is when compiling *!RunImage* files for applications. Create a directory called *SourceCode* inside the application directory and place all the library programs, the main program and !Compile in this directory. Now use code along the following lines in your main program (*MainProg* above) to save your assembly code file from within the main source program:

```
OSCLI("Save ^.!RunImage"+STR$~start+"
"+STR$~end)
*SetType ^.!RunImage Absolute
```

where the code has been assembled between addresses *start* and *end*. Now double-clicking on !Compile will assemble and save your !RunImage file in the correct place. RU

15 September 1991
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move to our new premises. As
ahead of schedule and the disrupt
to an absolute minimum. If onl
as simple!

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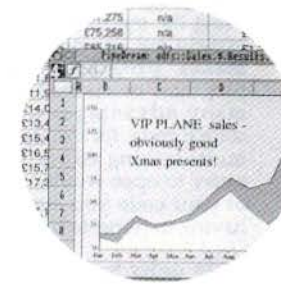

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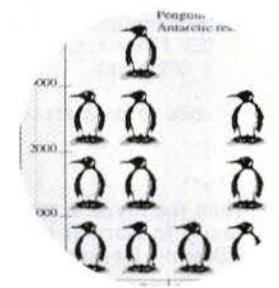

Wimp Function/Procedure Library Part 4

by Mark Moxon

This month we add some more useful routines for Wimp programmers as detailed below. The last routine returns the version number of the library, which is essential with a constantly evolving library such as this. The version given here is 0.4, to reflect the fact that this is the fourth installment of the library. We will provide a new version number for each version of the library.

There are also a couple of corrections to the library to enable windows to use sprites from user sprite areas (see Technical Queries in RISC User 5:7). The only routine that will change behaviour is Routine 5: *FNcreate_window*, which now takes an extra parameter: see below.

As an example of how Routines 24 and 26 work, if:

```
file$="adfs::HardDisc.$.Files.TestFile"
```

then the following are true:

```
FNleaf(file$)="TestFile"
FNbranch(file$)="adfs::HardDisc.$.Files"
```

Note that *FNbranch* returns a string that *doesn't* end with a full stop.

If you have any routines you think would be useful in the Wimp Library, then please do send them in. Alternatively, if you have any ideas for routines that you would like to see implemented, do contact us and we'll see what we can do.

PART 4: MISCELLANEOUS ROUTINES

CORRECTION to Routine 5: FNcreate_window
A new parameter has been added to the end of the parameter list.

sparea%	Pointer to sprite area to be used for sprite icons in window (or 1 for Wimp sprite pool)

Routine 24: FNleaf
Returns the name of a file given its full filename.

file$	Full filename

Routine 25: FNbranch
Returns the path of file given its full filename (i.e. the function truncates the filename).

file$	Full filename

Routine 26: FNzero_string
Returns a string that is stored in memory and is null-terminated.

point%	Pointer to null-terminated string

Routine 26: FNlibrary_version
Returns 100 times the version number of the library as an integer (e.g. version 0.4 would be return 40).

```
  210 =FNcreate_window(block%,x%,y%,w%,h
%,ww%,wh%,sx%,sy%,title$,12,wflag%,0,0,-
1,tflag%,7,2,7,0,3,1,0,ind%,i2%,i3%,1)
  280 =FNcreate_window(block%,x%,y%,w%,h
%,ww%,wh%,sx%,sy%,title$,selcol%,wflag%,
0,0,-1,tflag%,7,2,7,0,3,1,0,ind%,i2%,i3%
,1)
  300 DEF FNcreate_window(block%,x%,y%,w
%,h%,ww%,wh%,sx%,sy%,title$,input%,wflag
%,mw%,mh%,behind%,tflag%,tfore%,tback%,w
fore%,wback%,sout%,sin%,button%,icon1%,i
con2%,icon3%,sparea%)
  430 block%!64=sparea%
 1800 :
 1810 DEF FNleaf(file$)
 1820 LOCAL pos%,temp%
 1830 temp%=0
 1840 REPEAT
 1850 pos%=temp%+1
 1860 temp%=INSTR(file$,".",pos%)
 1870 UNTIL temp%=0
 1880 =MID$(file$,pos%)
 1890 :
 1900 DEF FNbranch(file$)
 1910 LOCAL pos%,br$,temp%
 1920 IF INSTR(file$,".")=0 THEN
 1930  br$=""
 1940 ELSE
 1950  temp%=0
 1960  REPEAT
 1970  pos%=temp%+1
 1980  temp%=INSTR(file$,".",pos%)
 1990  UNTIL temp%=0
 2000  br$=LEFT$(file$,pos%-2)
 2010 ENDIF
 2020 =br$
 2030 :
 2040 DEF FNzero_string(point%)
 2050 LOCAL string$
 2060 string$=""
 2070 WHILE ?point%
 2080  string$+=CHR$?point%
 2090  point%+=1
 2100 ENDWHILE
 2110 =string$
 2120 :
 2130 DEF FNlibrary_version
 2140 =40
```

RU

Using MessageTrans from Basic

by Alan Wrigley

Acorn's *MessageTrans* module enables programmers to write software which can easily be converted for use with a foreign language (see *Technical Queries*, RISC User 5:8). All textual messages generated by a program, including menu items, are placed in a separate text file called *Messages*, each one accompanied by a user-defined token. The module provides a number of SWI calls to expand a given token into the appropriate message whenever it is required by the program. In this way, conversion to a foreign language can be implemented simply by translating the whole of the *Messages* file into that language, leaving the program itself untouched. This article will describe how to use these SWI calls in a Basic program.

The first requirement for the programmer, of course, is to isolate all the text messages in the program and to create the *Messages* file from them. This should be a plain text file (filetype &FFF) containing a series of lines. In their simplest form, these lines have the following format:

```
<token>:<string>
```

The token may consist of any characters apart from ,) : ? or / but it makes sense to choose meaningful tokens where possible. Thus a message file might look something like this:

```
ERR1:File not found
ERR2:Number too big
MEN1:Info
MEN2:Quit
......
```

You may be able to find a *Messages* file in one of your applications to have a look at. In fact, the file format can be more complex than shown here and allows wildcards, alternative tokens and parameter substitution, but for the purposes of this article the simple form is sufficient.

Having created the message file, you now need to access it from within the program. First of all you should call SWI *MessageTrans_FileInfo* to find the file size. The details of this SWI are shown in Figure 1.

```
On entry:
   R1 = pointer to filename

On exit:
   R2 = size of buffer needed to hold
        the file.
```

Figure 1. Details of SWI "MessageTrans_FileInfo"

You could dimension a buffer of the size required using the DIM statement, but you cannot be sure when writing the program that there will always be enough memory (the file might be translated into a wordy language). It is probably better, therefore, to request extra memory, either from the RMA or by using *Wimp_SlotSize* (see *Technical Queries*, RISC User 5:4).

The next step is to load the file, using SWI *MessageTrans_OpenFile* (see Figure 2).

```
R0 = pointer to 16-byte info buffer
R1 = pointer to filename
R2 = pointer to file buffer
```

Figure 2. Entry parameters for SWI "MessageTrans_OpenFile"

The address passed in R2 is the buffer which has been set up to hold the file, while R0 contains the address of an additional buffer of 16 bytes which you must provide for the module to hold information about the file. We will call this the *info buffer* since we shall need to refer to it again. So the relevant section of the program may look like this:

```
   SYS "MessageTrans_FileInfo",,"<MyApp$
Dir>.Messages" TO ,,len%
   DIM infobuff% 15
   buffer%=HIMEM:size%=HIMEM-&8000
   SYS "Wimp_SlotSize",size%+len%,-1 TO
new%
   IF new%>=size%-len% THEN
```

```
   SYS "MessageTrans_OpenFile",infobuff%
,"<My App$Dir>.Messages",buffer%
   ELSE
   REM Generate "not enough memory" erro
r
   ENDIF
   .........
```

Once the file is loaded into memory in this way, two further SWIs exist to enable the program to read a string from a given token, and to create a menu structure from a list of tokens. The first of these is SWI *MessageTrans_Lookup*. Details of this are given in Figure 3.

On entry:
R0 = pointer to info buffer
R1 = pointer to token
R2 = 0 (to read the string) or
R2 = pointer to destination buffer (to transfer the string)
R3 = size of destination buffer (if R2<>0)

On exit:
R2 = address of string
R3 = length of string

Figure 3. Details of SWI "MessageTrans_Lookup"

The ability to transfer the string to another address is very useful for inserting text into indirected icons, for example.

The string terminator will be ASCII 10 if R2 was zero on entry, or ASCII 0 otherwise. In order to read the string in Basic, therefore, you will need to read the characters one at a time. So to read the string associated with a token *TOK1* into a variable *text$*, you would use:

```
   SYS "MessageTrans_Lookup",infobuff%,"
TOK1", 0 TO ,,ptr%,len%
   text$="":FOR i%=0 TO len%-1
   text$+=CHR$(ptr%?i%):NEXT
```

To insert the string associated with the token "ICON1" into an indirected icon you could use:

```
   !block%=whandle%:block%!4=ihandle%
   SYS "Wimp_GetIconState",,block%
   SYS "MessageTrans_Lookup",infobuff%,"
ICON1" ,block%!28,iconsize%
   block%!8=0:block%!12=0
   SYS "Wimp_SetIconState",,block%
```

where *iconsize%* is the maximum length of text permitted in the icon. Note that in this case we do not need to terminate the string with a carriage return since any control character will do for the icon text.

Finally, we will look at the creation of a menu structure from tokens. It is necessary for the module to provide a separate SWI for this, since the width of a menu is dependent on the longest item, and since the length of each item may be quite different in another language, clearly this value must be determined when the menu is created and not when the program is written. For this reason SWI *MessageTrans_MakeMenus* is provided. To use this SWI you must set up a menu definition block as shown in Figure 4. This block can contain a sequence of menus one after another (for example a main menu together with submenus).

The SWI decodes the tokens from this block, substitutes the strings, then creates from it a full menu structure and places this in a second block, calculating the menu width as it does so. The address of this second block can then be passed to *Wimp_CreateMenu* in the usual way. In other words, you would call *MessageTrans_MakeMenus* to set up a menu structure from items in the *Messages* file rather than create the menu structure yourself as is normally the case.

The SWI is called with the following entry parameters:

R0 = pointer to info buffer
R1 = pointer to menu definition block
R2 = pointer to block to hold completed menu structure
R3 = size of block at R2

So for a three-item menu structure to be placed at *menu%*, you would use:

```
   SYS "MessageTrans_MakeMenus",infobuff
%,menudef%, menu%,100
```

where *menudef%* holds the menu definition block. *menu%* should already have been dimensioned to 100 bytes (as passed in R3)

Continued on page 54

The PC Pages: Using MS-DOS 5

by Lee Calcraft

The version of MS-DOS supplied with the PC Emulator is somewhat ancient. Even purchasers of the very latest Emulator only get DOS 3.3. Moreover no DOS manual is supplied: you are simply referred to one of the many books on DOS. This is not very helpful, especially since you are very unlikely to find a book which caters specifically for the particular version of DOS supplied to you by Acorn.

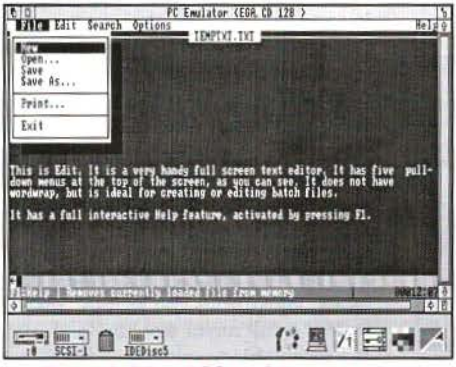
PC Emulator (EGR CD 128)
File Edit Search Options Help
TEMPTXT.TXT
New
Open...
Save
Save As...
Print...
Exit
This is Edit. It is a very handy full screen text editor. It has five pull-down menus at the top of the screen, as you can see. It does not have wordwrap, but is ideal for creating or editing batch files.
It has a full interactive Help feature, activated by pressing F1.
F1=Help | Removes currently loaded file from memory
SCSI-1
IDEDisc5

Figure 1. Edit - DOS 5's full screen editor

For around £50 (inc. VAT), however, you can get a copy of the very latest version of MS-DOS (DOS 5). This has many advantages over the likes of 3.1 or 3.3, and as a massive bonus it comes with a really first-rate manual. It is some 670 pages in length, and is produced to a very high standard. It has a useful index, and covers all aspects of DOS 5 in a clear and competent manner.

INSTALLING DOS 5

DOS 5 is easily installed on an emulated PC. However, you will need a PC hard disc partition, since it takes up around 2Mb, and you will probably need a reasonably recent version of the Emulator. I had difficulties when testing early versions, and can only be confident about versions 1.6 onwards. Just follow the installation instructions as if you were using a normal PC, inserting the three discs in turn as requested.

Once DOS 5 is installed you will have at your disposal a number of very useful features. For example, there is a full screen text editor (a proper one!) called Edit - so you can finally jettison the dreaded Edlin. DOS 5 also boasts a kind of mouse operated disc front end called *DosShell* which makes the selection of files a lot easier. This contains a task swapper which lets you swap between DOS applications.

There is also a neat *Undo* feature which will undelete deleted files and even unformat your hard disc, recovering the contents lost when formatting (will someone write one of these for the Arc please?!).

PC Emulator (EGR CD 128K)
File Edit Search Options Help
HELP: Survival Guide
Using the MS-DOS Editor:
• To activate the MS-DOS Editor menu bar, press Alt.
• To activate menus and commands, press the highlighted letter.
• To move between menus and commands, use the direction keys.
• To get help on a selected menu, command, or dialog box, press F1.
• To exit Help, press Esc.
Browsing the MS-DOS Editor Help system:
• To select one of the following topics, press the Tab key or the first letter of the topic. Then press the Enter key to see information on:
<Getting Started> Loading and using the MS-DOS Editor and the MS-DOS Editor Help system
<Keyboard> Editing and navigating text and MS-DOS Editor Help
Tip: These topics are also available from the Help menu.
Untitled
SCSI-1
IDEDisc5

Figure 2. Microsoft's interactive Help system at work in Edit

There is now a Help system for DOS commands - just type Help (or Help <command name>) at the prompt - and on the subject of the prompt, this now displays by default the path to your current directory and is a real boon - e.g.:

```
C:\PROJECT\DATA>
```

rather than the uninformative:

```
C>
```

But enough of this overview, and on to a slightly more detailed look at some of the major features; and I will begin by looking at a cunning little number called *DosKey*.

DOSKEY

This is a small TSR program (Terminate and Stay Resident) which helps with editing at the command line. One of its most useful features is that it allows you to recall (and reuse) the last ten DOS commands that you have issued. Pressing Cursor Up places the last-issued command at the command prompt, a further press replaces it with the one before, and so on. To execute a recalled command, just press Return. Or if you want to edit it, you can do so using the Left and Right Cursor keys together with Backspace and Delete - though note that you always start in Overwrite mode. Pressing the Insert key toggles this.

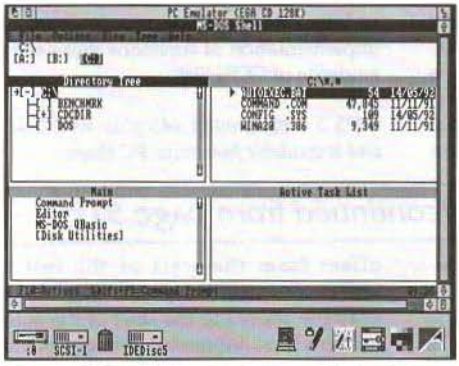

Figure 3. DosShell provides a useful visual front end to DOS

Other keys are also active at the command prompt when DosKey is installed. F7 for example displays all ten of the last issued DOS commands. DosKey also implements a command macro feature allowing macros to be created and stored in RAM for immediate use. It works in a similar way to the Arc's Alias facilities. Thus for example if you type:

```
doskey bu = copy my_src.c a:
```

this will establish the new command *bu* which backs up *my_source.c* by copying it to the a: drive. Such macros may contain multiple commands.

EDIT

If you have ever used Edlin, Edit will come as a welcome relief. It is a reasonably sophisticated text editor by PC standards, providing a clipboard and search and replace facilities. Text can be marked using the shifted cursor keys or the mouse, and may then be deleted, or pasted to the clipboard for moving or copying.

Edit even boasts an on-line Help system. This is a feature of much of Microsoft's more recent software, and as with other packages, the help offered is really quite extensive. Keywords in the explanatory text offer further cross-references, and moving the cursor to any highlighted word, and pressing F1 (the designated Help key), takes you to an explanation of the new topic. Pressing Escape clears the Help screen, and takes you back into editing mode.

DosShell

Typing *DosShell* at the command prompt invokes the disc front end module. It displays lists of files and directories on a multi-windowed screen. The left-hand scrollable window displays the directory tree, while the right-hand window gives a directory listing of the contents of the currently selected directory. Selecting a new directory in the left-hand window causes its contents to appear at the right. Selecting a file in the right-hand window and pressing Return (or double-clicking with the mouse) will execute that file.

The bottom window contains the following options:

Command Prompt
Editor
MS-DOS QBasic
[Disc Utilities]

The first takes you back into DOS, the second into Edit, and the third into the QBasic development environment (see below), while the last offers a number of disc utilities including Format, Disc copy and Undelete.

All in all, DosShell provides a worthwhile improvement over the DOS prompt for certain common tasks. It even permits you to do things like deleting directories, which DOS is reluctant to perform.

QBASIC

For all affectionados of Basic who have been saddened at the primitiveness of GW-Basic - weep no more. Microsoft's QBasic,

provided with DOS 5, makes up for it in many ways. It is still not as powerful as Acorn's Basic 5, but good enough for Microsoft to choose it as the source language for Edit (so if you have removed QBasic.EXE from your DOS directory to save space, Edit will not run).

If you type:

```
QBasic
```

at the command prompt (with an optional filename parameter), or select it from the Shell, you enter a Basic development environment. This contains a full screen editor (a version of Edit) for entering and editing programs, together with a lower window at which you may enter Basic commands in immediate mode. This is really quite slick when compared to GW-Basic's development environment (what environment?). You can run the program you are editing at the touch of a key, and even single-step it if you wish.

No written manual is supplied for QBasic, I am afraid, but good texts are readily available, and Microsoft's extensive Help system is operative within the package, so that if you have a problem with a keyword, just move the cursor to it in your listing, and press F1. You can also browse the keyword headings. The language boasts block IF-THEN-ELSE structures, DO-UNTIL loops, and functions which are declared and called in a similar way to functions in C. Perusing some of the programs supplied with DOS 5 is an interesting passtime, though in spite of the implementation of functions these still show evidence of GOSUBs!

DOS 5 costs around £45 plus VAT (£52 inc.), and is available from most PC shops. RU

Using MessageTrans from Basic (continued from page 51)

just as you would normally do for a three-item menu (i.e. 28+3*24).

```
+0 (n bytes) token for menu title
             (null for no more menus)
+n (1 byte)  title foreground colour
   (   "  )  title background colour
   (   "  )  work area foreground colour
   (   "  )  work area background colour
   (   "  )  height of menu items
   (   "  )  gap between items

followed by menu items each containing:
  (n bytes)  token for menu item
  Word align at this point
  (4 bytes)   menu flags
  (   "  )  submenu offset (see below)
  (   "  )  icon flags
```

Figure 4. Menu definition block passed to SWI "MessageTrans_MakeMenus"

The menu flags and icon flags are exactly as described for *Wimp_CreateMenu* in the *Programmer's Reference Manual* (so don't forget to set bit 7 of the last item's menu flags). The submenu offset, however, is the offset from the start of the full menu structure in memory (i.e. *menu%* in our example above) to the start of the submenu (or zero if no submenu). It is not possible to insert window handles for dialogue boxes using this method, and so they must be inserted into the completed menu structure after *MessageTrans_MakeMenus* has done its work.

If the menu item is indirected, the icon data for that item will be set up to point into the message file buffer at the correct place. If the item is writable, then the three icon data words in the menu structure (pointed to by *menu%* above) must be set up *before* calling *MessageTrans_MakeMenus*, and the string will then be copied into the buffer indicated by the first of those words.

This is all the information you need to use the majority of the MessageTrans facilities in your own programs. This month's magazine disc contains a short program demonstrating all the elements described in this article. RU

C Notebook

Hints and Queries

Compiled and Linked by Lee Calcraft

INFO CLICKING

Graham Hick notes that Acorn's more recent applications behave differently to the older ones when you click on the Info entry in the menu - the older ones display the info box, while the latest do not. He asks how to make our ANSI C Demo program behave like the more recent applications.

Acorn appear to have changed the rules on how Info boxes should work, but it is easy to alter an application to follow the new rules. Since the event handler is not given sufficient information to distinguish between the two types of event, the best way for your code to discover what is going on is to call the handy function *wimpt_last_event()*. The *wimp_eventstr* pointer returned by this function gives access to all the information that you need. The following line will display the Info box *only* when the pointer is moved across the Info entry:

```
if (wimpt_last_event()->e!=wimp_EMENU)
    cd_info_about_program();
```

If on the other hand the last event was a menu selection (i.e. Select or Adjust were clicked with the pointer over the menu) no action is taken.

USING ARRAYS OF CHARS

Julia McKillop asks how to use *colours[]* in the *wimp_wind* structure.

To see what is going on, it is best to think of *colours[]* as an array rather than a string of characters. It is effectively an array of single-byte unsigned integers, and this is how it is being used here. The first element supplies the title foreground colour, the next the title background colour, and so on.

To see what the assignments are, you need to note the reference to *wimp_wcolours* given with this structure (e.g. in the ANSI C 3 manual page 335, or page 291 in C 4). Then look for this reference in the enumerations and structures defined immediately prior to this (*wimp_wcolours* is defined on page 332 - 287 in C 4). In the light of this you might set up the *colours* array along the following lines:

```
  my_wind.colours[wimp_WCTITLEFORE]=GREY;
  my_wind.colours[wimp_WCTITLEBACK]=PINK;
  my_wind.colours[wimp_WCWKAREAFORE]=MUD;
etc., where GREY, PINK and MUD have been
#defined earlier on. Or more simply you
might opt for:
  my_wind.colours[0]=GREY;
  my_wind.colours[1]=PINK;
  my_wind.colours[2]=MUD; etc.
```

Incidentally, passing a pointer to char can be used in a similar way to supply a function with an array of indeterminate length. Thus the function:

```
void test(int len,char *n)
```

can be passed a pointer to an array of chars (or of unsigned one-byte integers) of any length.

TEMPLATE FONT BIND

Dave Appleby

Using outline fonts in a template seems to prevent them from loading, giving the error *Unable to bind font handle* from *template_load()*, and leaving the template file open. Does anyone know a cure for this?

Not on C 3. C 4, however, introduces a special function to solve the problem. It is called:

```
template_use_fancyfonts()
```

and is documented on page 262.

Please send us your C hints - all published hints will be paid for. RU

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Using ANSI C

Part 13: Displaying Text on the Desktop

by Lee Calcraft

As promised in last month's C Notebook, we are going to take a look at how to display text in a Wimp window. Unfortunately, this is not a trivial task. There is no simple function that we can call to do the work for us. The *txt/txtedit* suite of functions goes some way to providing text display features, but its use results in a large body of code being incorporated into your final executable, and the features provided are not fully under your control. For example, a *txt* window automatically takes the input focus when a file is loaded into it, and the caret appears in it. This can be confusing if you are trying to put up a read-only info window.

There are many other solutions to the problem however. The best approach in any given situation will depend on how much text you need to display, what form it is in, and how frequently, or how quickly you need to update it. A useful example of a fast redraw routine was given on RISC User disc 4:6. This included the complete C source for displaying a text window, with the special feature that word wrapping in the display was automatically altered as the window was resized in such a way that full lines of text remained readable at all times. The same routine is used to display the Help text on RISC User discs. This code is well worth looking at, and a copy of the source is included on this month's disc.

But if you are looking for a much simpler solution, and only need to display a maximum of say 50 to 100 lines of text, read on.

THE dbox METHOD

It is possible to incorporate text windows for modest quantities of text by using a dialogue box which contains one text icon for each line of text to be displayed. All you need then is a trivially simple event handler. To write a line of text you just make a call to:

```
dbox_setfield();
```

This automatically stores the text for you and updates it whenever necessary. *dbox* and the Wimp do all the work, and your program is hardly aware that anything is going on. The accompanying listing is the source for a complete Desktop application illustrating the technique.

It will install on the icon bar, and clicking Menu over the icon will yield a two-entry menu. Quit will do what it says, while Test will open a scrollable text window. Clicking Select on the icon bar icon will write text into lines 1, 2 and 25 of the display.

CREATING THE APPLICATION

To build the application, you will need to create a directory called *!C_Demo*, and supply it with a suitable sprite. You will need a *!Run* Obey file to set a wimpslot of 128K, to RMEnsure that CLib is loaded, and to Run *<Obey$Dir>.!RunImage*. The source file should of course be compiled to an executable named *!RunImage*, which is also saved in the *!C_Demo* directory.

The slightly tricky bit involves creating a suitable template. Use FormEd to create a window called *text*. This should be auto-redraw, and can be of any size that you wish. Now create icon 0 in the usual way. This will hold the top line of text for the display. Unset the *Border* flag of this icon, make it indirected with a text length of 90 characters, and unset the *Horizontally centred* flag.

Now move the icon to the top of the window, and drag it across to the full width of the window. The height of the icon is critical since it will determine the distance between adjacent lines. You will need to reduce this somewhat from the default value. Now use the *Copy* icon option, and click on *Down*. This will replicate the icon. Check that the vertical spacing between the two lines of text that you have created is reasonable, then clear the text from the two icons, and continue to replicate, using the Adjust button, until you have created one icon for each line of text that you want to display (the Demo program assumes at least 25 icons). Finally save the template to your application directory with the name Templates.

If you now run C_Demo it should behave as described. You should also find that because the code is so simple, it is a relatively easy matter to incorporate it into your own source.

HOW IT WORKS

Two lines in the initialising routine are used for setting up the dialogue box:

```
if ((text_box=dbox_new("text"))==NULL)\
  return FALSE;
```

```
dbox_eventhandler(text_box,\
  text_handler,0);
```

The first sets up the *dbox* using the "text" window from the Templates file. The second establishes a suitable event handler for it.

In fact almost all the features of our display are provided automatically - including window moving, resizing, scrolling and all other redraws. The only event that we need to handle is a click on the window's Close icon. This will be performed by our event handler as follows:

```
static void text_handler(dbox d,\
                         void *handle)
{
  if (dbox_get(d)==dbox_CLOSE) dbox_hide(d);
}
```

This uses the function *dbox_get()* to return the particular *dbox_field* activated in our dialogue box. If it is of type *dbox_CLOSE* we hide the dialogue box. We do not however destroy it, since if we do, we will lose any text written to it.

We could also react to clicks on any of the icons in our window, with one icon for each line of text. To do this we would need to ensure that the button types of the icons were of a type which returned events to the event handler (e.g. type *Click*). The function *dbox_get()* would then return the icon number of the selected icon. Thus it would return 0 for the top row, 1 for the next, and so on.

We have been talking about how we react to clicks on the dialogue box, but have not yet described how to put it on screen. Of course, our window does not appear until we instruct it to, and this is performed by the following call:

```
dbox_showstatic(text_box);
```

made in response to selecting the Test option from the icon bar menu.

Writing text to the display is also a simple matter. It is just a case of calling *dbox_setfield()*, as for example the following:

```
dbox_setfield(text_box,0,"First line");
```

This displays the words "First line" in icon number zero, the first line of the display. The great thing about this is that the text is stored within the window structure, so we don't need to keep track of it, and it is updated immediately, and whenever required - all without further intervention.

You can also read back what is stored at any line using:

```
dbox_getfield()
```

To clear a line, you can call *dbox_setfield()* with a null string.

This approach can thus provide a simple solution to what is often an awkward problem - though naturally it will not always fit the bill.

```
/*
 * Title:   C_Demo
 * Using ANSI C Part 13
 * by Lee Calcraft
 * RISC User Aug/Sept 1992
 * Copyright Lee Calcraft
 */

/*
 **fp   function prototypes
 **fd   function definitions
 **gv   global variables

 **main    main()
 **in      INITIALISATION
 **im      icon menu handler
 **ic      icon click handler
 **th      text handler
 */

#include "event.h"
#include "baricon.h"
#include "res.h"
#include "resspr.h"
#include "win.h"
#include "wimpt.h"
#include "menu.h"
#include "template.h"
#include "dbox.h"

#include <stdio.h>
#include <stdlib.h>

/*****************************************/
/**              CONSTANTS              */
/*****************************************/

#define APP_NAME        "C_Demo"
#define ICON_NAME       "!C_Demo"
#define MENU_ITEMS      "Test,Quit"

#define i_menu_test     1
#define i_menu_quit     2

/*****************************************/
/**fp       FUNCTION PROTOTYPES          */
/*****************************************/

static void i_menuproc(void *handle,\
```

```
                                char *hit);
static BOOL cd_initialise(void);
static void text_handler(dbox d,\
                         void *handle);

/*****************************************/
/**gv      GLOBAL VARIABLES              */
/*****************************************/

static menu i_menu;
static dbox text_box;

/*****************************************/
/**fd      FUNCTION DEFINITIONS          */
/*****************************************/

/*---------------------------------------*/
/**th          text handler              */
/*---------------------------------------*/

static void text_handler(dbox d,\
                         void *handle)
{

  if (dbox_get(d)==dbox_CLOSE)
dbox_hide(d);

}

/*---------------------------------------*/
/**im      icon menu handler             */
/*---------------------------------------*/

static void i_menuproc(void *handle,\
                               char *hit)
{
  switch (hit[0])
  {
    case i_menu_test:
      dbox_showstatic(text_box);
      break;

    case i_menu_quit:
      dbox_dispose(&text_box);
      exit(0);
      break;

    default:
      break;
  }
}


/*---------------------------------------*/
/**ic      icon click handler            */
/*---------------------------------------*/

static void cd_iconclick(wimp_i icon)
{
  icon=icon;
  dbox_setfield(text_box,0,\
                  "First line of text");
  dbox_setfield(text_box,1,\
                 "Second line of text");
  dbox_setfield(text_box,24,\
           "Twenty-fifth line of text");
}

/*****************************************/
/**in           INITIALISATION           */
/*****************************************/

static BOOL cd_initialise(void)
{
  wimpt_init(APP_NAME);/*initialise task*/

  res_init(APP_NAME);       /* resources */
  template_init();          /* templates */
  dbox_init();         /* dialogue boxes */

              /* create menu structure */
  if (i_menu = menu_new(APP_NAME,
              MENU_ITEMS), i_menu == NULL)
    return FALSE;

              /* put icon on icon bar */
    /* and register icon click handler */
   baricon(ICON_NAME, (int)resspr_area(),\
                          cd_iconclick);

/* establish icon menu handler */
  if (!event_attachmenu(win_ICONBAR,\
                    i_menu,i_menuproc,0))
    return FALSE;

  if ((text_box=dbox_new("text"))==NULL)
    return FALSE;
  dbox_eventhandler(text_box,\
                          text_handler,0);
  return TRUE;
}

/*---------------------------------------*/
/**main    The main() function          */
/*---------------------------------------*/

int main(void)
{
  if (cd_initialise())
  {
    while (TRUE)
      event_process();
  }
  return 0;
}
```

RU

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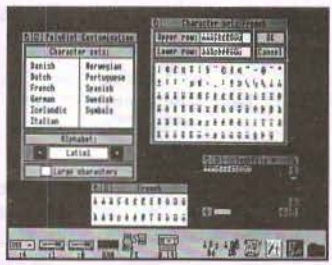

Open a window for any specified language, and this will display all characters which are impossible or difficult to obtain from the keyboard: for example, accented characters in French or umlauted characters in German. Select any one of these characters with the mouse and it will automatically be inserted in your document.

WHY POLYGLOT IS BETTER THAN ANY OTHER SYSTEM

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Desktop Applications

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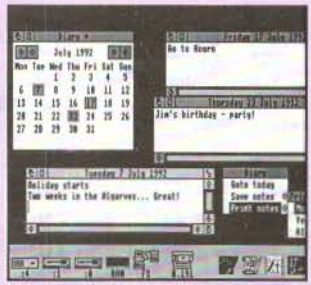

- **DataSheet** - data presentation package for creating annotated graphs
- **Calc_570** - an implementation of a scientific calculator.
- **CharDes** - character designer for creating new system fonts.
- **Diary** - a Desktop diary and calendar.
- **B_to_T** allows Basic programs to be edited without leaving the Desktop.
- **FileFind** performs a hierarchical search for a given file, application or directory.
- **SetType** - change the filetype of any file by dragging it to the icon bar.
- **HotKeys** - allows single key presses to perform a wide range of functions.
- **Mouse** - change the mouse speed merely by clicking on an icon.
- **Print** allows files to be printed just by dragging them to the icon bar.
- **NotePad** provides for up to eight pages of jottings.
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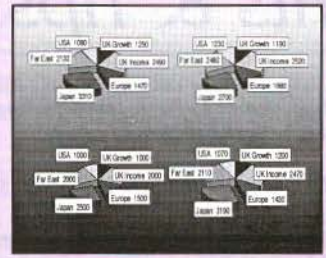

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Data can be Imported from other applications, such as spreadsheets, atabases, or created with a suitable editor as a text file.

Output is in standard Draw format for import into Draw or any other application, DTP for example.

Use of '**style sheets**' allows a set of options to be saved with data for future reference. User choice of start-up options.

Book

File Handling for All

by David Spencer and Mike Williams

File Handling for All is a comprehensive book which covers all the requirements of data storage and processing by computer, using the popular BBC Basic programming language for the examples. It is aimed at anybody interested in File Handling and Databases, whether beginners or more advanced users, and will appeal to all who want to learn more of this important subject.

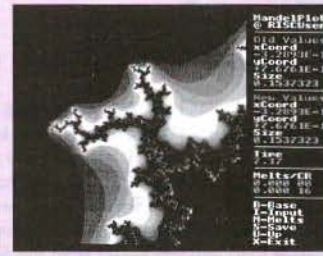
The book starts with an introduction to the rudiments of file handling, and in the following chapters develops an in-depth look at the different types of files e.g. serial files, indexed files, direct access files, and searching and sorting. A separate chapter is devoted to hierarchical and relational database design, and the book concludes with practical advice on developing file handling programs.

The associated disc (£4.75) contains complete working programs based on the routines described in the book and a copy of Filer, a full-feature Database program.

As a **Special Offer** to RISC User members the File Handling for All book and disc are available together for £11.95.

A compilation of the Best of RISC User Volume 4 plus special bonus programs

Volume 4 Special Disc



- **Form Designer** offers useful template files and sprites for designing forms and tables.
- **Mandelbrot Plotter** a superfast Mandelbrot generator.
- **Desktop Command Controller** allows you to run operating system commands from a user-defined menu on the Desktop.
- **Inlay** Multi-tasking audio cassette inlay creator.
- **Desktop Toilet** A novel application with appropriate digitised sound effects allowing you to flush away any unwanted files.
- **Yahtzee** A multi-tasking implementation of the traditional dice game.
- **Monitor Saver** displays changing patterns to prevent an otherwise fixed image from permanently damaging the screen.
- **ArcScan Index** to RISC User Vol. 4.
- **Archimedes ClipArt** An exciting selection of clip art.
- Five enjoyable new **Maestro music** files and a multi-tasking player.
- **New Outline Fonts** including Atlantis and Black Letters.
- **Converting Outline Fonts to Draw Files** enables text in an outline font to be converted into a standard Draw object and manipulated within Draw.
- **World by Day and Night** displays a map of the world with the position of the sun and areas of light and dark, automatically updated every minute.
- **Currency Converter** converts certain foreign currencies into pounds and vice versa.
- **Super BackDrop** allows you to stick file and directory icons onto the Desktop for quick access.
- **Disassembler** enables you to disassemble ARM code program files in a multi-tasking window.

Unbeatable Value for RISC User Members

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File Handling for All	**£ 9.95**	**£ 9.95**	Stock Code **BKO2b**
Disc supporting the book	**£ 4.75**	**£ 4.75**	Stock Code **BKO3a**
File Handling for All book and disc	**£11.95**	-	Stock Code **BKO2b**
Volume 4 Special Disc	**£ 9.95**	**£14.95**	Stock Code **PV4Sa**

Please add p&p. For postage see the prices on the back inside cover.

Don't forget to keep sending in your hints on anything relevant to the Archimedes range and remember, we pay for all hints we publish.

ICON BAR DROPPING IN RISC OS 3

Jon Fletcher

In RISC OS 3, if you drag any file onto the icon bar without dropping it onto an icon bar icon, then that file is run as if you had double-clicked on it. Although this can be useful, it can be a little strange to those of us who are used to aborting a drag by dropping it on an empty part of the icon bar.

TILING USING OVATION

John Wallace

Ovation can print two portrait A4 sides side by side (as in a pamphlet) by using a portrait A3 master page with the top half holding the left A4 page and the bottom half holding the right A4 page. To print these pages out, set the print orientation to *Landscape* in the *Print Setup* dialogue box and then print the file to print the first page. Then with print orientation still at *Landscape* set *Corner X* (again in the *Print Setup* box) to -210, and print the file again to print the second page. The value -210 can be altered in cases where text is very close to the edges of the pages to improve results.

LOADING A FILE WITH OS_FILE

Alan Wrigley

If you are using the SWI call *OS_File* to load a file (with R0=12,14,16 or 255), the description in the PRM is slightly misleading. A load address must be supplied in R2, and the PRM states that on exit R2 contains the load address. But beware - this is not the address you supplied on entry, but the BBC-style load address saved with the file; in other words, for a date stamped and filetyped Archimedes file, this "address" will be meaningless. It is particularly important to be aware of this if you are writing in assembly language, since you may wish to use the actual load address after the call, and from the PRM's description you may expect that R2 is preserved.

SCATTER GRAPHS IN CHARTWELL

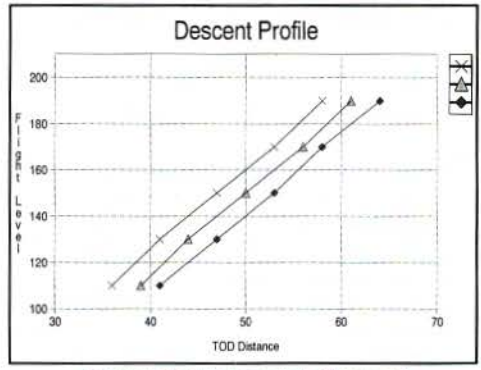
Ted Hunkin

As a 747 pilot, I wanted to use ChartWell to plot a *top of descent* (TOD) point against *distance* (x-axis) and *height* (y-axis) for different aircraft weights. The manual gave little guidance how to plot more than one curve on a scatter graph but it is possible to display three at a time. The data must be entered in the following format:

```
x1,y1,xx1,yy1,xxx1,yyy1
x2,y2,xx2,yy2,xxx2,yyy2
x3,y3,xx3,yy3,xxx3,yyy3
x4,y4,xx4,yy4,xxx4,yyy4
x5,y5,xx5,yy5,xxx5,yyy5
```

where x,y defines curve 1; xx,yy defines curve 2; and xxx,yyy defines curve 3. For example the following data produces the graph shown:

```
36,110,39,110,41,110
41,130,44,130,47,130
47,150,50,150,53,150
53,170,56,170,58,170
58,190,61,190,64,190
```



Multiple Scatter Graphs in Chartwell

MAESTRO IN RISC OS 3

Mike Cumpstey

In some screen modes the Maestro application in RISC OS 3 does not display its notes and staves correctly, but shows them approximately twice the size they should be, creating a very cluttered display. The solution to this problem (according to Acorn) is to delete the sprite files in the !Maestro directory called Sprite22 and !Sprites22.

RIGHT ON DESKEDIT

Lee Calcraft

If you shrink a DeskEdit window (or an Edit window, for that matter), then you may find

that the actual name of the file being edited (the leafname) is not displayed in the title bar because the title bar is too small. One way round this is to load the template file !DeskEdit.Templates into FormEd, and to open up the window called *main*. Now go into the *Title icon* submenu in the *Window flags* submenu and choose the option *R justified* so it is ticked, and the *H centred* option so it is not ticked. This will right justify the title bar of the main window so the leafname is always visible.

SIDEWAYS RAM IN THE BBC EMULATOR

Mike Cumpstey

If you find that the *SRLOAD command does not work in the BBC Emulator 65Host, load the !65Host.!Run file into a text editor and look near the end. There is a line containing the following text:

```
SRAM 4 5 6 7
```

which may be commented out; if it is, then there will not be any sideways RAM implemented on your system. Remove the comment bar to create four banks of sideways RAM in ROM sockets 4,5,6 and 7.

TEMPLATE EDITING CAN BE BAD FOR YOUR HEALTH

Phil F. Pearl

If you load into FormEd a template file which contains a lot of window definitions, then FormEd may return the error 'Too many windows'. This can cause extremely serious problems on the Desktop if you have unsaved work. The problem is that if you try to save your work and the application tries to pop up a Save box, then the error 'Too many windows' is returned as FormEd has stolen all the available window definitions. Worse still is that menus are also windows, so you cannot quit FormEd or any other application through their icon bar menus. Only applications that have single key saves that do not open dialogue boxes (such as Ovation's Ctrl-S save) will be able to save their files. The only way out of this situation (apart from a Reset) is to close a few windows on the Desktop, but remember these must not be editor's windows with unsaved data, or the editor will try to open an error box and you're back to square one. You have been warned!

PC EMULATOR AND THE POUND KEY

Gerald Turpin

A little known feature of the PC Emulator is that DOS emulates a standard PC keyboard too well under it; for example, with the configuration correctly set to *Country=UK* and *Keyboard=US+* (in the *CONFIG.SYS* file) it is not possible to access the pound sign. It's no use changing the keyboard to a UK keyboard as then you lose the backslash key, which is a vital character in DOS. To avoid having to type Alt-156 on the numeric keypad every time you want to enter a pound sign, install the *ANSI.SYS* driver in your *CONFIG.SYS* file (e.g. by the line DEVICE=C:\DOS\ANSI.SYS). Then you must assign the # key (or any other little used key) as a £ key instead. This is done by putting the command:

```
ESC[A;Bp
```

in a batch file, where A=ASCII code of old key and B=ASCII code of new key. The ESC character is notoriously difficult to insert, but a convenient and visible method is to use PROMPT $e. Create a batch file called *POUND.BAT* containing the following lines:

```
PROMPT $e[35;156p
ECHO ON
PROMPT $p$g
CLS
ECHO OFF
```

and run this by putting the line:

```
POUND
```

in your *AUTOEXEC.BAT* file. The first PROMPT command assigns the hash key to produce the pound symbol, and the second PROMPT sets up the prompt to be used in DOS. The ECHO commands are necessary to make sure the DOS prompt is set up by the correct command.

WHICH VERSION OF RISC OS AM I USING?

Mark Moxon

The Basic function INKEY-256 returns a number which depends on which Acorn operating system you are using. A quicker method of finding out which version of RISC OS you have in your machine is to press F12 in the Desktop and type:

```
*Help Modules
```

The version number of the first module (MOS Utilities) is the version number of the operating system. RU

RISC User Public Domain Library

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Our Public Domain discs contain as near as possible to 800k (and not less than 700k). Each disc includes a 'Read Me' file, and there are some instructions with the programs. The discs are offered as seen and are available to RISC User members *only* for the new low price of **£1.60**.

To order tel: 0727 40303, fax 0727 860263, or write (quoting memb. no) to: RISC Developments, 117 Hatfield Road, St. Albans, Herts AL1 4JS.

DEMOS

PD12 Disc 5 sound + graphics demos from Hugo Fiennes of the Serial Port.

PD21 Disc 3 demos, Balls, Balls2 and BIA-Tetris (the latter is also a game).

PD22 Disc 3 demos, Noah, Chips and Demo1.

PD23 Disc 4 demos, Bounce, Grimbo, ColDemo and Rotate.

PD24 Disc 3 demos, Demo, Gopher and Overscan.

PD25 Disc 4 demos, Deskballs, DudsDemo, EgIntro, and Z-Brother.

PD26 Disc 4 demos, Sister, SkullDemo and Wibble.

PD27 Disc 2 demos, GrannyChow and Windows.

PD36 Disc 3 demos, Leapin' Fish, SinDemo and Swallow.

PD37 Disc A massive four-part demo called 'No RISC No Fun'. This has to be the best demo yet for the Arc. Amazing!

PD42 Disc 4 demos, AceDemo4, Cubitus, Scorpius and 3D_RayPic.

GRAPHICS

PD13 Disc 'Projector application - displays films created with the Ace Computing Mogul package. Six example films are included.

PD18 Disc displays several still and animated ray traced pictures.

PD33 Disc displays several still and animated ray traced pictures.

PD44 Disc A selection of fractal generation programs and utilities.

PD45 Disc 2 applications, Creator and Translator, allowing exchange and display of graphics picture files between Archimedes and other computers. Also some high quality demo pictures plus a mode converter and a mode utility.

DRAWING AND ART

PD15 Disc Arctist+ and BigM, both 256 colour art packages, along with Design, a symmetrical pattern designer.

PD41 Disc 4 applications: 'Display' for displaing of Draw files by dragging them into a window. 'Drawplus' is an object oriented drawing package that may be used as an alternative to Acorn's Draw, with many enhancements over Draw. 'Drawstrip' enables the easy creation of function keystrips using Draw. 'Drop' enables Draw files to be rotated in 3D and then saved again in their new perspective.

EDUCATION

PD14 Disc !REG, a student register system which replaces classroom registers. A system for managing the recording and reporting required by the National Curriculum and data files for Pipedream for NC statements of attainment in science.

MUSIC

PD01 Disc Soundtracker playroutine plus the following tunes: Aces-Hi, Acidbat2, Afl, Alf, ArtNoise, AxelF, Backpopped, Big, Blitzwing, Blizzard02.

PD02 Disc Soundtracker playroutine plus the following tunes: BatMix, Bobby, Brill, Burning, Chartmix, Chipgene, Demo2.

PD03 Disc Soundtracker playroutine plus the following tunes: Confusion, Crack, Criminal, Dear, Demons, Dns, Elephant.

PD04 Disc Soundtracker playroutine plus the following tunes: Doc1, Funky, Ducksong, Electric_2, EndTheme, Enutomed, Equinoxe5, FinalTFDM1, FinalVis.

PD05 Disc Soundtracker playroutine plus the following tunes: Pyc, GoodTune, Hello, HowDeepIs, Huba, Humanoid, Hunters, Hymn, Idea, Igarun, IntoB.

PD06 Disc Soundtracker playroutine plus these tunes: Jazzid, Jmj_China, LastNinja2, Like, Magnetic4, MegaForce0, Minimize, Mod, New_Biz.

PD07 Disc Soundtracker playroutine plus these tunes: MyWay, Nothing-2, Oooerr, Outrun, Pacman, Pat, PetShop, Pretend, SaySaySay2, Steeve.

PD16 Disc 250 tunes for loading into the music package Maestro, variety enough to suit most tastes.

PD08 Disc Soundtracker playroutine plus these tunes: Setrox, Tarzan, TGM, TheModel2, TjatMikes, Toccata, Unit, Vprtex, We're, Yezz.

PD09 Disc Soundtracker playroutine plus these tunes: Acid_House, Bananas, Cambod, Crok, Cute, Dallas, Deadlock, Dragnet, Yazoo.

PD10 Disc Soundtracker playroutine plus the following tunes: DemoSmash, FFSound, Five, GSCTheme, HiEnergy, Oxygene2, Piano, PopCorn, PumpUp.

PD11 Disc Soundtracker playroutine plus the following tunes: Rescue, Rockit, Round,Scratch, Scratch2, Show, SmokeOn.

PD40 Disc The Jukebox playroutine plus Tracker tunes: Acid House, Six2, TeddyBears, Canon, Breathe, Rag It.

PD43 Disc An application Coconiser, very similar to Tracker, that allows the creation of tunes by sequencing digitally sampled sounds. Demo tunes.

PD46 Disc The Jukebox playroutine plus the following Tracker tunes: Beginning, Blue Peter, Frog Song, IcelceBaby, Monty Mix, Over The Bow, Rawhide, SkyXmasMix, Thunderbird.

PD47 Disc A selection of SoundTracker and Tracker playback routines and utilities including a keyboard and spectrum analyser.

TRICKS AND NOVELTIES

PD17 Disc A collection of 27 amusing novelty programs. Some produce the weirdest effects!

PD32 Disc An application Cookie - puts up a window containing a 'fortune cookie' or a well-known saying or piece of philosophy. Be warned! Very addictive once seen, also rather zany. There are some 6000 sayings. Also a scroll text demo with soundtrack music called Invade which also features a space invaders game within it.

UTILITIES AND APPLICATIONS

PD28 Disc 20 utilities of various types: 1stFile, ASm2, CloseUp, Crypt, Dir, Display, Drawlink, Dustbin, Filetypes, FileUtils, Find, Keys, Loadprogs, MultiPrint, NewBar, NewCodes, PD_Impress, PrinterTx, ProgGalc, and Set_Type.

PD31 Disc 17 utilities/applications: Address Book, Address Labeller, DiscSpace Display, Desktop Calendar, Cassette Inlay Printer (Two of these!), DPS Disc Reader, Automatic Application Creator, ROM Speed-Up, Arc to Psion Transfer, System Utilities, STD Codefinder, Trash Can, Front end for Twin, Front end for View, Volume Controller, Control of Pointer by keys.

PD38 Disc 15 utilities/applications: a 1st Word Plus file converter, a 1st Word Plus printer driver for Star LC200, a text outliner application, a hypertext program (like Genesis), a CD database, a video tape database, CMOS RAM saver and loader, disc sector editor, file save reminder, fast formatter, font printer, a COPY options setter, TEXT to DTPfile converters, plus a print spooler.

CLIPART AND PICTURES

PD29 Disc Over 4 megabytes of Sprite pictures which can be used as clip art. The files are in a compressed form and the decompression utility is included.

PD30 Disc Over 2 megabytes of Sprite clip art and Draw filess. The files are in a compressed form and a decompression program is included.

FONTS

PD35 Disc Eleven PD outline fonts for use in RISC OS applications: Stencil, American Typewriter, Bodoni, Revue, Brushscript, Cooper Black, Fritz Quad, Garamond, Hull, London and Optima.

COMMS

PD34 Disc Arcterm3, a full comms software package. Arc100, a scrolling text terminal. Grapevine, another scrolling text terminal but multi-tasking. TaskData, a multi-tasking viewdata comms package. Download, an application for transferring files between machines via serial port. Timer, a utility for recording on-line time and call cost. The latest version of Sparkplug, the file decompression program. A complete set of programs for running a bulletin board system on your Archimedes.

GAMES

PD19 Disc 10 games: Adventure, Battle, Battleships, Connect4, Darts, Fish (Pelmanism), Fruit Machine, Golf, Hangman and Impact.

PD20 Disc 12 games: Invaders, Line Of Five, Othello, Pelmanism, Rocks, Rubik Cube, Simon, Solitaire, Star Trek, Tetris, Tile Trial and Yahtzee.

PD39 Disc 6 games: Pac Man (in a window!), Arc Patience, Breakout (inside an icon!!), Creepie (Centipede), Pelmanism and International Golf (Brilliant!)

Public Domain Special Collection

The selected PD software listed below was fully described in Simon Burrows' article on the PD scene in RISC User 5:7 (June 1992).

PDX1	**Draw Plus**	Extended Draw
	Label	Label printing
PDX2	**Address D**	Address labels
	AGP	Advanced graph plotter
	Daily	Screen clock
	Draw Cross	Crossword generator
	Memphis	RAM filing system
	Translatr	Graphics image converter
PDX3	**ArcFS**	Decompression utility
	Risc BBS	Bulletin board system
	Impulse II	Inter-task communication
PDX4	**ArcFS**	Decompression utility
	PVray	Ray tracing
PDX5	**Hangman**	Classic game
	Interface	Classy Wimp display
	Menus	Wimp Menu editor

These discs are still available at the standard price of **£1.60** (inc. VAT and p&p).

Public Domain Special Collection

SAMPLER DISC (PDS1)

Contains the following sample programs from our Public Domain Software Library:

SoundTracker, Accounts, SC Label, Follow, Hangman, Multiprint, Rotate, STD and Wanda

Write-Back... Write-Back...

Compiled by Mike Williams

Acorn's Invisibility

Following my editorial comments (RISC User 5:7) about Acorn's lack of commercial visibility, Julia McKillop sent me a cutting from Electronics Weekly dated 27th May 1992. An article entitled *High-Risc decisions* mentioned virtually every player in the RISC field (Sun Microsystems, IBM, Motorola, Hewlett-Packard, DEC, Texas Instruments et al), with the exception, that is, of Acorn. As Julia McKillop says, "Do you get the impression something is missing?" I took the opportunity of a recent visit to Acorn to raise this issue. A spokesman for the company expressed considerable concern over Acorn's omission from the article. Fine sentiments, but it is this lack of acceptance in the wider world that Acorn must themselves address.

Intersheet Files on an Arc

The following information has been received in response to David Symes' request in *Write-Back*, RISC User 5:7 for help in importing Intersheet files into suitable Desktop applications.

Selecting option 3 of the main menu of Intersheet results in the exporting of the sheet as an ASCII file. There is a choice between exporting **Results** *or Contents (in the latter case, a maximum of 80 characters per box is allowed). Which columns or rows to export can also be detailed. In both cases the ASCII file ceated is made up as follows:*

The file starts with an '@', followed by the number of the top-left box saved, then the contents/results of the first row (a tab separating each box from the next). At the end of the row a carriage return is sent, and then the next row and so on.

J.M.A.H. van Vredenburch

Reviewers and Reviewed

I would like to comment on remarks by A.J.Griffon and Graham Wickes in the June issue of RISC User (5:7) in Write-Back.

Firstly about reviews: I used to write for one of the computer magazines which deal with Acorn products, and there is no doubt that reviewers there were given subtle hints from the editor as to what was wanted. Objectivity and honest appraisal came second place to ensuring that the product manufacturer advertised in that magazine. On one occasion I was asked three times to re-write my review, the basic reason being that the overall honest opinion was too honest!

There is no doubt that RISC User has far more balanced reviews, but contrary to Mr. Griffon, I do like to see them because I believe that when I have read your reviewer's thoughts, they can be more readily relied upon for objectivity and accuracy.

In relation to pattern fills, mentioned by Graham Wicks, I have had serious problems presenting graphs in reports published with my A3000. They look great on screen, but my 24-pin printer shows a different story. By altering the grey shades in the Draw palette and selecting separate columns or segments I have been able to adapt my graphs to show more reasonable results. So come on Acorn (or Minerva or RISC Developments). How about some pattern fills for our graphs?

Barrie Hawkyard

Improving the Quality of Grey-Scale Images

Ledger White's article, **Improving handheld Scanner Images**, *in the June issue (referring to my earlier article,* **Improving the Quality of Half-Tone Printing** *in RISC User 5:5) has prompted me to write further on this subject.*

Readers may be unsure whether to use one, or the other, or both techniques. The following remarks may help.

The first article omitted to say that the author used a Mitsubishi MH195AG scanner. This uses a 4 x 4 dither pattern, not the 3 x 3 referred to in the second article. There is no 'banding' with the Mitsubishi images (processed by Scan Light Plus software) and hence the techniques of the second article are not applicable here.

The second article states that "there is very limited scope for contrast enhancement with only 16 levels of grey" and reference is then made to the first article. In fact the technique of the first article is to map the 16 grey levels of the image onto a nominal 64 grey levels provided by the printer driver. Though this halves the resolution, the overall effect can

be a real improvement in perceived quality of the printed image.

In summary, if processed scanned images displayed on screen are disappointing, then the methods of the second article may help. On the other hand, if the screen images are satisfactory but the printed versions are not, then the methods of the first article should be considered.

David Cawsey

We felt that both authors contributed usefully to this subject, with David Cawsey, as he says, concentrating on improving print quality, and Ledger White on screen output. Both have a part to play.

Newcomers Respond

Margaret Penfold's article in our series *Into the Arc* on the subject of upgrading to an A5000 (see also a further article from the same author on experiences with the PC Emulator in this issue) provoked a response from several readers with similar experiences. While we do not have the space to print all of these, Hedley Hunnisett's comments below are typical of those received, while Mr. Cumpstey throws more light on a printing problem highlighted in Margaret Penfold's original article.

Margaret Penfold's recent article was most interesting, having upgraded from an A3000 to an A5000 myself. As she said, setting up was easy, but why is the mouse lead twice as long as the A3000's? I have half the lead coiled with elastic bands, but it looks a mess! The swivel base on the monitor is a boon, but I miss the sound channel. The great advantage was that it had a volume control.

Impression II with RISC OS 3 and the new printer manager is a dream. Computer Concepts immediately supplied the updates for RISC OS 3. With the A3000 I had reverted to Wordwise Plus for ordinary correspondence, due to slow printing. Printing is now so much faster that I am back to Impression even for routine chores such as label printing.

Screen updates are now much faster. Moving around large drawings produced with Draw used to be painfully slow. I tried the new Draw, but repeatedly found a snag - when trying to enlarge a selected object by clicking on the bottom corner ear, it suddenly grew to gigantic proportions, with the screen scrolling to accommodate it. I have now reverted to DrawPlus.

Like Margaret Penfold, I thought 2Mb of RAM would be completely inexhaustible, but loading scanned images from Impression soon proved otherwise. I have now upgraded to 4Mb.

I still find the old Basic editor with Mike Summerton's Wimp Front End very useful, but the two column print routine does not work on the A5000 - does anyone know a cure?

The ability to move windows off the edge of a screen is a useful feature. The IDE disc is incredibly fast. Saving a data file to floppy usually results in the drive light being on for several seconds. I had difficulty in convincing myself that the file really had saved when the IDE drive light gave such a very brief flash. All in all, the A5000 is a machine of which Acorn can be justifiably proud.

Hedley Hunnisett

And a problem solved:

I was interested to read in Margaret Penfold's article that she had experienced a similar problem to myself in getting the printer to print more than one line on a page. However, I have recently solved the problem which I believe to be due to a bug within the printer manager (!Printers).

When the **Edit paper size** *option in the printer manager's main menu is used to create a new paper size, the data is not recorded correctly. All the data in the Text margins section is saved as zeros instead of the values you type in. One of these parameters is 'height', meaning the number of lines per page, which should be set to 70 to get 6 lines per inch on an A4 sheet.*

The solution is to delete your new paper size file which is called PaperRW within the !Printers directory. Also take a look at the default paper size file for your printer to see what the file should look like. For a dot matrix printer the file name is !Printers.dp.Resources.PaperRO. *Initially, I was not aware that I had created a new paper size file - it just happened by accident as I was trying to configure the system.*

J.M.Cumpstey

Pin Board

Support for Frame-Grabbing Software

I'm sponsoring a computer program which will grab frames from the techno_I video digitiser and save them as true 25-bit colour film. Would anybody else like to add to the £100.00 that I'm paying the writer? If so make cheques and postal orders payable to David Heath. Do you have anything to add to the list below? Anybody sending £15 or over will get a free copy of the software.

Specification:
It should be able to capture and save as many frames as possible (using the whole screen or in windows) compressed if necessary; 25-bit colour (7 bits luminence, 6 red, 6 green, 6 blue).
It should have editing facilities, again 25-bit (select and drag).
Save and create its own palette.
Save a single frame and/or a selected group of frames in 25-bit colour.
Export and save in the Ace Computing Splice Film format.
Save each sprite or a selected group of sprites.

David Heath, 26 Luxmore Close, Leigham, Plymouth, Devon PL6 8NX, tel. (0752) 781286 (address supplied at the author's request).

Fonts for Hewlett-Packard LaserJet

I read with interest, though no real comprehension, the Help file on the RISC User 4:9 disc which described how to download fonts for PostScript laser printers. I use an Archimedes 310, Impression II and a Hewlett-Packard LaserJet IIIp to do my DTP work. When I have simpler needs, I have experimented with internal fonts in the LaserJet using Edit and various Escape sequences.

I'd like to download fonts to the laser printer so that I could use more varied ones than the inbuilt LaserJet ones. One way might be to obtain the Hewlett-Packard soft fonts, which come with the download program, and download them using the PC Emulator. I'd then have to leave the emulator and try using Edit.

I have my doubts whether this would work, and I wouldn't be able to use the Archimedes fonts I've bought. Is there a simple way to download and give IDs to Archimedes fonts so that I could use them as permanent soft fonts? I'd be grateful for any help.

P.M.Morgan

The *Pin Board* feature is intended to provide readers with the opportunity to 'put up' notices to inform other readers, pass on messages or to seek help and advice on any subject related to the Archimedes. This is an important element of our *Write-Back* pages, which are proving very popular. Simply send your notices for display to *Write-Back* at the normal RISC User address, stating that you want your notice put on the Pin Board.

RU

Technical Queries

Alan Wrigley answers some more of your queries.

Dear Sir
I have created a group of radio icons in a Wimp program, and everything works correctly, except that when I click with Adjust instead of Select on the currently selected icon, it is de-selected, leaving none of the icons selected at all. Is there a way to stop this happening?
Alexander Pickard

Some people see this as a bug in RISC OS, but this point is debatable. Radio icons are intended to mimic the action of a group of interactive buttons on a radio set, and it is often possible (though not usually desirable) to unset all the buttons in such a group, leaving the selection in an ambiguous state. So Acorn's simulation is in fact quite accurate.

This leaves it up to the programmer to prevent the occurrence, and this is quite easy. All you need to do is to detect button clicks with Adjust over one of the radio icons, and use *Wimp_SetIconState* to set the selected bit for that icon. The section of code (within your procedure which handles button clicks) would look something like this:

```
IF block%!8=1 THEN
!block%=whandle%:block%!4=ihandle%
block%!8=&200000:block%!12=&200000
SYS "Wimp_SetIconState",,block%
ENDIF
```

Dear Sir
I was interested to read in the June issue of RISC User that the size of characters in the system font could be altered, but is it possible to alter their appearance to make them look more attractive?
K. Latif

Back in RISC User 3:3 we published an article describing how to do just that, but it is worth returning to the topic for the benefit of newer readers. Each character in the system font is made up from an 8 x 8 pixel grid, and this can easily be redefined using Basic's VDU23 command, the syntax for which is as follows:

```
VDU23,charcode,r1,r2,r2,r4,r5,r6,r7,r8
```

where *charcode* is the ASCII code of the character you are redefining. *r1-r8* represent the rows of the grid from top to bottom, and each is an 8-bit number made up by accumulating the values of those pixels in the row which are set (i.e. those which will be plotted in the character). The left-most pixel corresponds to the most significant bit (i.e. a value of 128) while the right-most pixel is the least significant (a value of 1). In other words, if you draw your character on the 8 x 8 grid and you find that in the top row, the left-hand bit is set but all others are clear, then *r1* will be 128. If on the second row the two central bits are set and the others clear, the value of r2 will be 24 (i.e. 16+8), and so on.

To help you get an idea of how the existing characters are defined, you can read any character definition by using *OS_Word* 10. This requires a 9-byte parameter block, with the character code to be read inserted at *block*%+0. So to read the definition of character "A" (ASCII 65) you would use:

```
?block%=65
SYS "OS_Word",10,block%
```

The eight rows of the definition will be returned at *block*%+1 to *block*%+8, from top to bottom.

You can of course run a program containing sequences of VDU23 commands to redefine the character set each time you switch on your computer, but a much better way is to create a file which will install a new system font when run. There is a filetype (&FF7) specially provided for this purpose (to distinguish such font files from outline fonts they are called "BBC font" files because the BBC micro used the same 8 x 8 pixel character grid). A BBC font file is nothing more than a whole string of VDU23 sequences which, when run, is sent straight to the VDU drivers and is therefore processed in exactly the same way as if the commands had been issued from a program or the Basic command line.

Technical Queries

Double-clicking on such a file installs the new font immediately; the whole screen is redrawn straight away, and all future output will be in the new font. You should note, however, that issuing a **Alphabet* command will restore the default font.

The RISC User 4:5 magazine disc contains a versatile character editor which includes the facility to save your own BBC font files.

Dear Sir
I am writing a Wimp program in which I have created a window. When I try to open this window however, nothing appears on the screen, but if I then try to drag a directory viewer across the screen, it leaves a trail behind it. I have examined my code until I'm blue in the face but can't see anything wrong. Can you help?
M.J. Hargreaves

From your description it sounds as though you have unset the redraw bit (bit 4) in the window flags (indicating to the Wimp that it needs help from the task to redraw), but you have not included any redraw code. What happens is that after returning poll reason code 2 to your task (open window request), if this bit is unset the Wimp will then return reason code 1 (redraw request). Your task must redraw the window immediately, and so the Wimp will expect the next action to be a call to *Wimp_RedrawWindow* for your window. If instead it gets a call from the Filer to open a directory viewer (which is what will happen if you drag a Filer window around), it will most likely get very confused!

If you do not need to redraw anything in the window yourself, you should set bit 4 of the window flags. If you *do* need to perform a redraw, the task should carry it out immediately on receipt of reason code 1, by making the necessary calls to *Wimp_RedrawWindow* and *Wimp_GetRectangle* as described in the *Programmer's Reference Manual*, or in *Mastering the Wimp Part 5* (RISC User 3:3).

Dear Sir
Is there a simple way to merge two sprites?
Tom Hardman

Indeed there is, but if you read the description of Paint in the User Guide you might be forgiven for overlooking the possibility. You can merge sprites quite easily with Paint's *Use sprite as brush* option. Open a Paint window to display the first sprite, then select the brush option from the *Paint Tools* window. Type the name of the second sprite into the writable icon opposite *Name*, click on OK, and you will now find that you can move the second sprite around over the first with the mouse. When you are satisfied that it is in the right place, clicking with Select will set it at that position. You can scale the second sprite, or plot it with logical operations (OR, AND etc.) - see the User Guide for full details. Remember that the sprite background will be plotted as well, unless it is transparent.

This is a very useful way of getting a picture into your computer which is too large for your scanner. Scan it in two or more sections, then load the first section into Paint. Create as many extra columns or rows as you think you will need to add the next sprite, then use the sprite-as-brush option to merge the second with the first. It may take a little practice to line it up accurately at the edge where the two meet (Paint's zoom option may be useful here), but it is worth some effort if you want the result to look right. RU

• POINTS ARISING • POINTS ARISING • POINTS ARISING •

Wimp Function/Procedure Library 3
(Disc Only) Volume 5 Issue 8

A couple of errors crept into the disc version of the WimpLib program on the Volume 5 Issue 8 disc (the magazine listings are perfectly correct). The corrections are: in lines 690 and 700 put a minus sign before y%; and in lines 1020 and 1070 put a minus sign before the first occurrence of 68. This month's disc contains the corrected library. RU

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- "Res Publica" is a new PD library aimed at Italian people. It features the best of English PD, for the demo disc send L5000 (Italian Liras) to Christian Ghezzi, via B.da Urbino 2, 20035 Lissone (MI) Italy.

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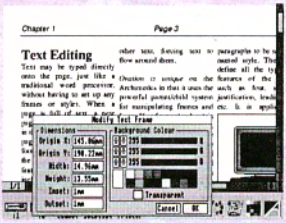

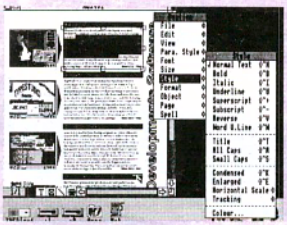

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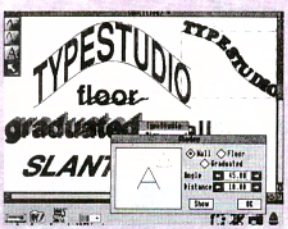

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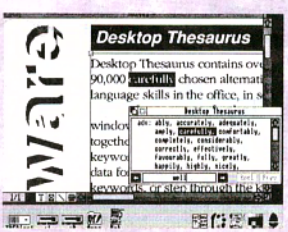

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